

# Amateur Radio

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Number 7  
July 2011  
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# Amateur Radio

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### This month's cover

The main photo this month does not need explanation – it shows the IC-9100 transceiver. Thanks go to Icom for supplying the high resolution image. Also included are two inset images of events at the WIA Annual Conference in Darwin. The upper photo shows Michael Owen VK3KI and Spud Murphy VKBZWM during a break in proceedings. Photo by John Longayroux VK3PZ. The lower photo is a view of some of the participants at the Darwin Trailer Boat Club. Photo by Dianne Ashton VK3FDZ.



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## Contributions to Amateur Radio



Amateur Radio is a forum for WIA members' amateur radio experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are welcome and will be considered for publication. Articles attached to email are especially welcome. The WIA cannot be responsible for loss or damage to any material. Information on house style is available from the Editor.

### Back issues

Back issues are available directly from the WIA National Office (until stocks are exhausted), at \$9.00 each (including postage within Australia) to members.

### Photostat copies

If back issues are unavailable, photocopies of articles are available to members at \$2.50 each (plus an additional \$2 for each additional page in which the article appears).

### Disclaimer

The opinions expressed in this publication do not necessarily reflect the official view of the WIA and the WIA cannot be held responsible for inaccurate information published.

## Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs; that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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**Peter Young VK3MV**

# Editorial

Peter Freeman VK3PF

## Another successful Annual Conference

From all reports, the WIA Annual Conference in Darwin was a success. Congratulations go to all involved. You will find several articles outlining the events and key outcomes in this issue, including a sample of photographs from the event.

There was not much time between the events in Darwin and the production deadline for this issue – only a few days. Many thanks go to all who have contributed material so that we could publish some reports.

Personally, I am sure that many members will be pleased with the decision to announce the following year's conference venue and dates during the current year's event. So everyone can now pencil the dates in your diary for next May and consider if there is a means of making your way to Mildura. I can assure you all that the local amateurs are a very friendly and hospitable bunch. A few years ago I was in Mildura for a couple of days for work. I was browsing the local tourist information centre and ran into an amateur who had made the trip to Churchill for GippsTech a year or two earlier. We exchanged a few words – he was in the middle of a job – and then said our farewells. Before I had made my way back to the hotel, I had been called on the mobile phone and invited out to dinner with a small group of amateurs. The invitation was a surprise, and the dinner most enjoyable.

## Radio reviewed

We have been able to prepare a review of a new radio for this issue – the IC-9100. I must thank Michael VK3KH for accepting the invitation to "have a go" at something very new for him. I am sure that he was attracted by the prospect of playing with a new radio, especially one including all the bands to the 23 cm

band. I certainly found the radio to be an excellent performer – I also had the pleasure of exploring the transceiver's performance. It was certainly tempting to not return the radio! As noted in the article, we sincerely thank Icom Australia for allowing us to borrow the radio.

I trust that you, the readers, find the review of interest. We shall keep our eyes and ears alert for opportunities to review other equipment. Of course, you are most welcome to prepare a review and to submit it for publication.

## Update on QSLing

We have finally been able to print an article about how to exchange QSL cards in VK, prepared by the previous National QSL Manager, Neil Penfold VK6NE (SK). We were preparing to publish the article last year when news of Neil's death arrived. The article was withdrawn and we have waited until all the required changes for the processes had been made and Geoff VK3AFA checked the article. Neil's article required only very small changes, so it is terrific that we can finally publish the article.

## Articles and cover photos

We are slowly catching up with our publication backlog, so the number of articles on our Articles Register is growing smaller.

Please do prepare an article on your latest project and submit it for consideration. We rarely reject articles and only occasionally require extensive reworking of an article. Sometimes we have delays when following up some details that may not be clear, but the technical editors do their best to help an author to prepare the item so that it is ready for publication.

Depending upon the topic of the article, it may be published

Continued on page 5



## WIA comment

Michael Owen VK3KI

### The WIA Annual Conference

I am writing this email just after the WIA Annual Conference, Darwin 2011 and a weekend at Upper Hutt, near Wellington, New Zealand attending the NZART Conference.

So, it makes sense now to write about our WIA Annual Conference. Actually, what we call it has not been all that consistent, sometimes the AGM, sometimes the AGM/Open Forum but we are now standardising on "WIA Annual Conference".

I think we now have a very clear basic format, refined originally by Robert Broomhead for the Parkes Conference in 2007 and developed by him since then. I think we also know what many of our members want.

Let me run through what I understand to be the basic ideas that we now have for this event.

First, our members look for our annual event to be held somewhere interesting in its own right, not a capital city. Parkes, Churchill, Broken Hill and Darwin filled that requirement.

Then, they ask that we tell them as soon as possible where and when, so they can arrange holidays, or even just a few days break to attend.

When we hold our Conference is rather restricted by the fact that it is also our Annual General Meeting, and we need to hold that within five months from the end of our financial year. Our financial year ends on 31 December, and then we have to have an audit completed, reports written and printed and circulated with this magazine.

That all means that we cannot move very much from "some time" in May!

The program, while not cast in granite, is pretty clear, too.

Friday night is usually a dinner, built around either an interesting speaker (the Lord Mayor of Darwin talking about the ecology and FrogWatch in Darwin) or an interesting venue (the Telstra Tower and Alto Restaurant on Black Mountain in Canberra).

Saturday is the Annual General Meeting and Open Forum. We treat the AGM as what it is, the statutory meeting, and then use the Open Forum for the consideration of reports covering all aspects of the WIA, encouraging discussion on any topic anyone wants to raise, and because it is informal, we do not have to worry about relevance, words in motions or procedure.

One important feature of the day is the announcement and presentation of WIA merit awards. Some are very special, such as Honorary Life Membership or the GA Taylor medal and only given occasionally, others are annual. They are important because it is the way we recognise those who do much for amateur radio and the WIA.

Saturday afternoon has been a symposium, and quite a few people are telling us that they would like more technical subjects covered next year.

Saturday night is the Annual Dinner. Usually we would look for a relevant and interesting speaker or some other interesting attraction.

More and more, Sunday is becoming a non-radio day, the visit to Dick Smith's place, the visit to Litchfield National Park.

NZART has Sunday as their day for meetings of groups, some presentations as well as a tour for those who want to participate (usually the partners!).

What was very special about

Darwin was for the first time a club played a major role in setting the program, looking after participants and making it all happen.

It is amazing what a small group of workers can do, even running a barbecue without burning the meat!

For next year, we have already announced that the WIA Annual Conference will be in Mildura, Victoria, with the Sunraysia Radio Group as the radio club supporting the event.

Early next year we plan to ask our Advisory Committees and our clubs for their suggestions as to venues and their willingness to support an Annual Conference.

That way, we would hope to announce at the WIA Annual Conference, Mildura 2012, the venue for the 2013 Conference. We would be looking for somewhere interesting and with some new ideas about some of its features. We would be looking for strong support from a club or a group of clubs.

After the Darwin Conference, some of us sat down with some of the leaders of the Darwin Amateur Radio Club, and discussed how it had all worked, and what we had learnt. That is being put together in a document, so we can give the Sunraysia club a useful guide.

Did you know that a New Zealand amateur and his wife had come to our Conference in Darwin?

Next year, the NZART Conference 2012 will be held on the New Zealand Queen's Birthday weekend of 1 to 4 June at Nelson.

Perhaps there are WIA members who would like to be welcome at the NZART conference at a very

Continued on page 5

## WIA Board meets in Darwin

Following the Annual Conference the WIA Board met in Darwin on Monday 30 May 2011.

The Board reappointed Michael Owen VK3KI as President and Phil Wait VK2ASD as Vice President.

An important task of the Board at its meeting following the Annual General Meeting is to appoint or reappoint the various Contest Managers, Coordinators and other officers.

John Spooner VK4AJ5 wished to retire as Manager of the Jack Files Contest, and Michael Charteris VK4QS was appointed as his successor.

The other Coordinators and Managers were all reappointed.

The Board has been concerned for some time about communication to members, and appointed a Communication Strategy Group to be led by Chris Platt VK5CP.

WIA matters were discussed, and it was decided that a complete review would be desirable, leading to appropriate rules applicable to all WIA contests, as well as the creation of a Contest Committee composed of at least of all the Contest Managers.

This project is being led by Bob Bristow VK6POP.

Following the Board meeting, the President, the Treasurer and the WIA Manager met with Darwin Amateur Radio Club President Spud Murphy VK8ZWM and Secretary Peter Blackadder VK8HPB to review and finalise the weekend.

## WIA at NZART Conference

Each year the NZART and the WIA take turns to be represented at the other's annual Conference.

This year it was the turn of the WIA and President Michael Owen VK3KI and Treasurer John Longayroux VK3PZ attended the NZART Conference 2011 at Upper Hutt, near the capital Wellington.

Almost the same number of

people registered for the NZART Conference as for the WIA Annual Conference a week earlier in Darwin, including one ZL and his wife who attended both conferences!

Michael and John participated in the NZART Council meetings before and after the Conference, met with the NZART IARU Committee and with the NZART Administration Liaison Officer Don Wallace ZL2TLL and canvassed a number of matters where both societies will benefit from working together.

They also visited the NZART office in Upper Hutt.

Interestingly for Australian amateurs, the NZART Annual General Meeting passed a resolution that the NZART would negotiate with the New Zealand regulator to seek an amendment to the New Zealand Radiocommunication Regulations to increase the power limit for amateur stations on 160, 80, 40, 20, 17, 15, 12, 10 and 2 metres from 500 to 1000 watts, other bands remaining at 500 watts.

Next year, it will be the turn of NZART to come to the WIA Annual Conference 2012 in Mildura.

## WIA meets with ACMA project team

The President's "Comment" published in the November 2010 issue of *Amateur Radio* magazine quotes extensively from the WIA's letter to the ACMA proposing a means by which Advanced amateur licensees can seek a variation of their licence to allow higher transmitting power levels.

In response to the WIA's letter, the ACMA agreed to review the matter, and on Monday 16 May, WIA Directors, Michael Owen, VK3KI and Peter Young VK3MV met with the project team responsible for the review.

The ACMA is a facts based Commonwealth regulator and the meeting assisted in clarifying the related issues of electromagnetic interference, electromagnetic

radiation and associated matters.

The WIA was able to provide more detail on the background and respond to questions on this detail.

The ACMA is still considering this matter.

## VK amateurs presenting at the Dayton Hamvention 2011

Three VK amateurs are making presentations at the Forums that are being held in conjunction with the 2011 Dayton Hamvention.

At the Young Ladies' Radio League Forum, Tina Clogg VK5TMC is providing a run down on the arrangements for the YL International Meet 2012 that will take place in Adelaide.

At the TAPR Forum, Phil Harman VK6APH is talking about "Griffin - a Whisper and a Chirp". Griffin is a new HPSPDR project that will provide a low power beacon exciter, covering HF, 6 m and 2 m that will generate simultaneous beacons on multiple bands, each modulated independently. This revolutionary new beacon mode will enable real time propagation measurement and reporting for all HF and VHF bands.

Also presenting at TAPR is David Rowe VK5DGR on "CODEC 2 Explained". CODEC 2 is an open source CODEC designed for low bit rate speech over HF/VHF digital radio. Whereas most low bit rate CODECs are proprietary and require licensing fees, CODEC 2 is unique in that it is open source, allowing experimentation and modification. Author and developer David Rowe will explain CODEC 2 and how it works, breaking down the complex DSP into simple terms. He will present examples of CODEC 2 use with amateur radio.

## WIA meets with the ACMA on station inspections

On Monday 16 May, WIA Directors, Michael Owen, VK3KI and Peter Young VK3MV met with senior staff from the ACMA.

The meeting related to the issue of the ACMA's amateur station inspection program and the related issues of what sort of equipment an amateur can possess and operate and the manner in which such inspections are conducted.

The WIA's position on the issues is set out in the "Comment" published in the April 2011 issue of *Amateur Radio* magazine. The WIA representatives sought to reinforce

the WIA position at the meeting.

The ACMA is currently reviewing the issues and welcomed the WIA's input.

### The Radio and Electronics School

In May the WIA released a statement for itself and for Ron Bertrand on behalf of the Radio and Electronics School.

The WIA continues to highly value the Radio and Electronics School as

an extremely valuable contributor to the future of amateur radio in Australia.

It is pleased to say that as a result of recent discussions the School is assured of the WIA's continuing recognition of its role and Ron assures everyone that he has every intention that the School will continue to operate.



## Editorial

Continued from page 2

quickly, or may take a number of months until we have completed all the preparatory work and can find space in the magazine. Almost all articles submitted will eventually be published.

In addition to articles, we also need excellent photos for the cover –

preferably accompanying an article. For publication, especially on the cover, we need good photographic composition and exposure and adequately high resolution.

Anyone considering preparing an article and/or photos should look at the *AR* magazine section of the WIA

web site and follow the link to the page on Contributing Material.

Cheers,

Peter VK3PF



## WIA comment

Continued from page 3

attractive place, with local wineries, boutique breweries and many craft shops? Look at [www.nelsonnz.com](http://www.nelsonnz.com)

Perhaps there are NZART members who would like to join us in Mildura, on the mighty Murray River, great weather and also with local wineries? Look at [www.visitmildura.com.au](http://www.visitmildura.com.au)

If you are a WIA member you will always be welcome at a NZART Conference (without a vote, of course).

If you are a NZART member you will always be welcome at a WIA Conference (without a vote, of course).

Perhaps, even if we cannot do it next year, we should make sure that there are more than just a few days between our two Conferences?

Perhaps there are some clubs or groups of clubs in Australia that will now start working on a suggestion for a great weekend in May 2013?



## Plan NOW for the 54th JOTA 2011

The **54th Jamboree On The Air** will take place on **15 and 16 October 2011**.

This year's theme is: **\*Peace, Environment and Natural Disasters.\***

An exciting activity that focuses on the strength of Scouting: to act and support in unforeseen circumstances. Scouts are prepared.

Radio amateurs and clubs also need to be prepared - your planning should by now be well underway. Contact your local Scout or Guide group to confirm their plans.



# QSLing in Australia

Neil Penfold VK6NE, National QSL Bureau Co-ordinator

Since amateur radio began so many years ago, there has often been an exchange between the operators of the stations, in written form. Amateurs of many years ago, when they could rightly claim to be experimental, were interested in building their own equipment. They also were interested in the distant operator's gear and how far their emissions travelled. This established the exchange of the information in a written form, and required it to be posted to the distant operator. Early evidence exists that it was common practice to post the contact details and equipment in use, even to adjacent suburbs. As the experimenter (amateur) was often alone in his activity, this exchange was of great interest and value to him. Circuit diagrams, antenna descriptions, the power transmitted, and often other station details were exchanged, and so grew this information exchange which became an interesting addition to the construction of stations and their operation.

Here is the information from a QSL card dated 23 October, 1929:

To Radio BRS 250 from 2MS  
Kenya.

Receiver: O - V - 1 Cct: QST  
1929 DX Receiving All World

Transmitter Cct. Colpitts, Valve  
AT40, H.T. Dynamotor 40 mA, 1000  
Volts.

Aerial V.F. Zepp F.W. 21 m  
Transmitting G, F, D, ON, OZ, LA,  
SP, HAF, HB, VS, ZA,

Remarks. Vy mny tnx for yr rpt  
ob. Hpe to QSO u one day. QRN vy  
bad here, Cheerio OP. George F K  
Ball. ARRL SARL.

From this early beginning grew the interest in collecting these pieces of information. This was their evidence of the amateur making contact with local and overseas amateurs. The intrinsic value of the card became a collector's item and in the early days of radio, the written



A typical QSL card – one of thousands handled by the WIA bureau each year.

word was the communication of the masses. Eventually the amateurs found that the cost of posting their confirmation cards needed to be reduced. This was achieved by each club or organization introducing a system where it would post off in bulk the members letters or cards. And so the "QSL via the buro" began to be heard.

Today the bureaux system is a world-wide organization operated by societies large and small. It has many benefits, and its detractors as well. Many articles have been written about QSLing and have usually been the basis of further articles and letters to the editors of the various amateur journals. What started as an implied courtesy has grown to almost an industry within the ranks of the amateur population.

Last year, a report to the WIA Board, for the 2008 year, gave a figure of nearly 80,000 QSL cards being handled by the bureau system within Australia. With propagation at the low level being experienced, imagine the QSL card numbers when the peak of the solar cycle comes along. If ever, Hil And Australia has

only 4500 WIA members compared to Japan with a million plus (?); the workload must be enormous for them!

The ARRL has implemented an electronic database titled Logbook of The World (LoTW). Many amateurs now upload their log of contacts to this database. It provides a readily accessible method of confirming a contact with a station, if that station provided his contact information to the database. There is also a shortcoming with it, as there are many awards available and some societies do not recognise the database for their awards programs. So the QSL card still remains a necessary requirement for those awards. The DXCC Awards of the WIA do not accept LoTW, or eQSLs, which is another form of QSLing that has arrived on the scene of late.

Over the past 15 to 20 years the cost of QSLing has risen with the printing of cards, and with postage. A great number of the bureaux with only a very low number of members have closed their bureau operations due to the rising postage rates.

The VK Outwards Bureau is not



in a position to assist the member when it receives cards that are for stations that only accept QSLs via their manager, and the manager's callsign is not clearly indicated on the QSL card, or when the manager himself is not a member. Then there is the QSL cards received for bureaux that are non-operational. For example there is no bureau in 1A0, 3B8, 3C, 3C0, 3D2/C, 3D2/T, 3W, 3X, 4W, and the list goes on to include many more prefixes.

To quote an example of the operation of the WIA Outwards Bureau: one Kg of QSLs, that is, approximately 330 cards, costs the WIA \$21.25 to post to JA, and to DL it costs \$31.35. And then there is the inevitable delay in the exchange of cards through the bureau due to a number of factors. Many bureaux are now holding cards until an economical mass versus the number of cards is reached, before posting the package. Continuing with the wait for cards to move through the bureau, even the large societies have resorted to holding cards till they are posted in bulk. To give some examples of recent deliveries to the VK6 bureau, from France came 660 cards, with the last delivery being in May 2007; from the USA, the last delivery of 600 cards was January 2008. And from JA came a mailbag via a shipping firm of 1400 cards on 12 June 2009, with the last delivery on 23 February, 2009. But to show how long the period between deliveries could be, a parcel arrived from SV in June 2005, then April 2008 and none since then.

The WIA National Outwards Bureau, with all members sending their cards there instead of to a local (state based) bureau can build up a batch of cards within a reasonable time; whereas the bureaux of VK, with the possible exception of VK2 and VK3, would take a long period to make up an economical package.

For members of the WIA, there is no charge made for on forwarding their QSLs to overseas or VK bureau. It is asked only that, to ease the burden of the manager, members sort their QSLs into entities, along the lines of the DXCC list of

societies. The address of the WIA Outwards QSL bureau is Box 3073, Teralba, NSW 2284.

From time to time, private individuals have offered a type of bureau service. The QSL policy of those societies with affiliation with the International Amateur Radio Union requests that its members only despatch QSL cards to similar societies. As with any policy, there are interpretations by societies of the IARU guidelines!

The QSL policy of the WIA is printed in the Callbook published by the WIA. For the information of readers of this article, the following is part of that policy: Affiliated clubs may collect cards on behalf of its WIA members and forward them in reasonable sized batches to the WIA Outwards QSL Bureau. The Outwards Bureau Manager will confirm that the club members sending cards are WIA members. Members not requiring cards should notify their area bureau manager directly.

With the introduction of the WIA National Inwards Bureau, it will receive all Incoming QSL cards to Australia from overseas societies, then sort and despatch to state bureaux. With the new Inwards Bureau receiving all cards, it is anticipated that the overseas societies will not need to hold cards for the nine Australian bureaux, and with all combined will now send more frequently to the one bureau for Australia.

Members need to make arrangements with their local manager for delivery or pick up of their cards. Non-member's cards are not handled by the WIA Bureaux. This also is the case with a number of overseas societies; those that are known here are: CT1, DL, HS, OK, SM, SP, I, and there are other societies that refuse to handle non-member's cards. As postage costs have become even higher, most societies no longer return QSL cards received for non members.

For direct QSLing, the address of most operational stations may be found on the [www.qrz.com](http://www.qrz.com) data base. This has a wealth of

information, and is available for free. The method of QSLing the station when looked up on [qrz.com](http://qrz.com) usually indicates how the operator treats QSL cards that are received. The request ranges from: bureau only to the station, via the operator's QSL manager who also needs to be looked up, QSL direct only to the operator, and so on to the note of NO eQSL.

As the desire to receive a QSL card from a rare or exotic location, or it is just one as a memento of the QSO, there has developed over the past years the desire to send a direct QSL by mail to the operator's address. This has led to the QSLing by direct mail as almost a requirement if one is to ever receive a QSL from some operators, DXpeditioners, some QSL managers, or an operator that does not employ a manager and has very few contacts. Then there are operators that simply cannot afford to print cards or even afford postage. In the latter case, the inclusion of some currency helps to obtain a card. But sending money in an envelope still invites pilfering in some countries. The International Reply Coupon does help, but not all countries will accept the IRC. The IRC currently sells at Australia Post for \$2.85. As a side issue here, Australia Post seems to have increased its mailing charges to many overseas countries in the past two or three years.

Where has all this been leading, you may be asking by now: it is an attempt to explain some of the ways that you as an individual seeking a QSL card may take in obtaining same. However, just give a thought of how many volunteers have given their time and effort to send and receive your cards within the QSLing system.

(Editor's note: For many awards, all that is required is confirmation of the contact having occurred. Asking the other operator to add his/her confirmation on your card, and then to sign the card prior to returning it back to you may be sufficient for the award you are seeking.)



# The WIA 2011 Annual Conference in Darwin

WIA

108 people were registered for the 2011 WIA Annual Conference held in Darwin on 27, 28 and 29 May 2011.

After registration at the Travelodge Miramabeena Resort on Friday afternoon, the participants enjoyed a buffet dinner at the Darwin Trailer Boat Club. Highlights of the evening were the sun setting over Fannie Bay and an address by the Lord Mayor of Darwin, Graeme Sawyer, who spoke of the top end weather and ecology and the depressing damage caused by the cane toad.

On Saturday morning the formal Annual General Meeting was followed by the Open Forum.

Papers presented to the Open Forum had been mailed to the participants before the meeting. In addition to the statutory financial, directors and audit reports, the papers submitted to the Open Forum included an additional report from the President and reports in respect of ARDF, ARISS, Assessments, Awards, Bookshop, BPL and Standards, Clubs, Contests including the John Moyle, the Remembrance Day Contest, the Ross Hull Contest, VHF-UHF Field Days and Oceania DX Contest, D-STAR, Emergency Communications, Historian, IARU Region 3, the Monitoring System,

ITU and WRC, National Technical Advisory Committee, QSL Bureau, Repeaters and Beacon Coordination, Webmaster, WIA Centenary and WIA National News.

The need to attract young people to amateur radio emerged as a theme linked to many of the issues raised in the papers presented to the Forum. Following a discussion of contests, unanimous support for the RD contest to start at around lunchtime emerged.

Saturday afternoon was devoted to a symposium, led by David Donnelly VK8DON who described the role of Bushlight in bringing renewable energy to remote communities. Darwin Amateur Radio Club President Spud Murphy VK8ZWM spoke of amateur radio and other things in the Top End.

106 people sat down to a successful dinner on Saturday night, with the highlights of Doug McArthur VK3JUM telling stories of radio and amateur radio in old Darwin, and well known singer and local amateur John Mitchell VK8JM providing memorable entertainment.

On Saturday night the venue for the 2012 Annual Conference was announced as Mildura, Victoria, on the weekend of 26/27 May, supported by the Sunraysia Radio Group.

Sunday saw a visit to Litchfield National Park, the magnetic termite mounds, a visit to Florence Falls and a barbecue at Wangi Falls provided by members of the Darwin Amateur Radio Club, and Sunday evening saw the end of the conference with another sunset and a meal at the Mindil Beach Sunset Market.

WIA President Michael Owen VK3KI said that the weekend was an outstanding success thanks particularly to the dedicated band of helpers from the Darwin Amateur Radio Club, the work of WIA Manager Mal Brooks and the many others who contributed. He said that it was a laid back event that captured the atmosphere of the Territory. It was attended by amateurs from every state and territory except Tasmania and even an amateur from New Zealand.

The members of the Darwin Amateur Radio Club, its President Spud Murphy and Secretary Peter Blackadder, the drivers, the barbecue experts, those who looked after the drinks the people who looked after the partners, even meeting everyone on arrival at Darwin airport made 2011 yet another memorable year.



## Spotlight on SWLing

Robin L. Harwood VK7RH

Yes we are still here after the failed prediction of Harold Camping that the World would end on 21 May. It certainly gained a lot of exposure on the mainstream media and generated a lot of derision and criticism. Other religious leaders were forthright and blunt before and after the non-event. It turns out that the guy really

believed the World was going to end based on his befuddled calculations. 24 hours after the Rapture failed to materialise, Camping appeared at a press conference looking very confused and shaken and then said he made a miscalculation and that it was going to happen on October 21.

His radio network was going

into overdrive before 21 May but in the days following that date, Family Radio repeated an earlier "Open Forum" and then commenced playing old style hymns continuously. I have monitored this on a variety of channels including 7004.5, 9465, 9615 and 13820. The audio was very distorted at times and there

were no announcements with the programming not synchronised, presumably due to satellite and internet feeds. 9465 was interesting on 26 May at 1259 as the hymns suddenly stopped and then there was a Russian announcement followed by time pips at 1300. The ID was "Radio Rossi" in Moscow!

Evidently Camping had booked airtime on a sender within the CIS and they just yanked the distorted audio and started relaying their own network.

It has also been announced that Deutsche Welle in Cologne is severely cutting their shortwave output from 256 hours a week to just 53. This will commence from July 1 and also see the closure of the Trincomalee relay station in Sri Lanka. This has been easily heard here in Australia, especially on 9735 at 2100 in English. Apparently the

Kigali relay station will continue because there is very poor internet coverage across Africa. Ironically Rwanda has probably the highest internet take-up in Africa judging by a recent CNN report.

Radio Netherlands in Hilversum may be the next to further slash short-wave output and a decision is expected to be made shortly. The BBC World Service has dramatically cut back their output and the realisation that they may have gone too far has prompted an internal review.

You will have heard the sender known as the Firedrake. This usually broadcasts traditional Chinese music which is heavy into percussion instruments. The senders are employed in jamming external or clandestine broadcasts directed to China and often are on odd channels usually outside of the normal

broadcasting allocations.

One recent transmission was on 13920 and some of you may be aware that this has been a long term Australian WEFAX channel, now based at Charleville in Queensland.

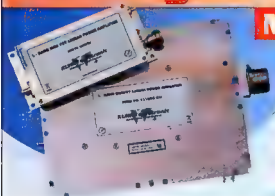
Firedrake popped up on 13920 in mid-May trying to jam a small Taiwanese broadcaster allied to the Falun Gong. VMC in Charleville was a casualty of this radio war. Fortunately the radio war did not last and the clandestine and its jammer retired to other pastures, leaving VMC to continue sending weather faxes.

Well that is all for now. It is a pleasure being able to hear clearly once more.

Good monitoring and 73 de VK7RH.



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# Awards at the Annual Conference Darwin 2011

WIA

The WIA Annual Merit Awards were announced and presented at the Annual Conference in Darwin on the weekend of 28/29 May 2011.

The GA Taylor medal was presented via a voice link to Jim Linton VK3PC, for his contribution to amateur radio over many years and in particular for his contribution as a member of the WIA Centenary Committee in providing professional guidance in respect of the promotion of amateur radio to the media.

The Chris Jones Award was presented to the recently retired WIA Secretary Geoff Atkinson VK3AFA, and the Ron Wilkinson Award was presented to Phil Harman VK6APH for his contribution to amateur radio by his work in relation to digital techniques generally and the contribution of articles to amateur radio literature.

The Higginbotham Award for contribution to amateur radio generally was presented to Jack Bramham VK3WWW for his work over many years including his ongoing contribution as the WIA ARDF Coordinator.

The Al Shawsmith Award for Journalism was presented to David

Smith VK3HZ for coordinating the 'VHF/UHF - An Expanding World' column in *Amateur Radio* and in particular for his reporting of weak signal communications. The Amateur Radio Technical Award was presented to Paul McMahon VK3DIP for his technical contributions to *Amateur Radio*, and in particular his two part article 'A generic interface for the amateur experimenter' published in the September/October, 2010 editions.

A number of President's Commendations were announced, including Paul Hoffmann VK5PH for his contribution to amateur radio generally and in particular for his work in relation to the establishment of the WIA National Field Day in 2010.

President's Commendations were also announced for Mike Patterson VK4MIK for his work in relation to the promotion of amateur radio in Far North Queensland over many years and John Bishop VK2BK for his contribution to amateur radio generally and in particular for his work in relation to the representation of the WIA on Standards Committees.

Two members of the Darwin Amateur Radio Club were recognised. They were Terry Hine VK8TA and Frank Turnham VK8FT for their contribution to the club over very many years.

Eric Van De Weyer VK2VE accepted President's Commendations for himself and on behalf of the Facilitators of the Radio and Electronics School, which provides a unique and vital service in teaching those who wish to qualify as radio amateurs.

The School's Facilitators so honoured were Adam Jarosuk VK4IM, Bryn Taylor VK4BRT, Peter Andjelkovic VK3KP, Tony Bedelph VK7AX, Lou Blasco VK3ALB, Ron Hayman VK4RH, Raff Lerro VK4KQ, Rusty McGrath VK4JM, Tim Roberts VK4YEH, Peter Rumble VK4KX, Mick Todd VK6JMA, Matthew Weatherley VK4TMW, Michael Wright VK5ARD, George Glendinning VK4AJL, Reg Emmett VK7KK, Ben Short VK7BEN, Jeff Creed VK4SE and Gail Lidden-Sandford VK4ION.



## An improvement to the hidden 40 metre X beam

Ron Holmes VK5VH

A number of amateurs have indicated interest in the 'Stealth antenna' as published in the July, 2010 edition of *Amateur Radio* magazine. They may like to see an improvement made since submitting the original article. The original drawing and the improved arrangement are placed together, respectively in Figures 1 and 2.

The centre PVC pipe has been lengthened to two metres. Originally I avoided making it longer than one metre because the portion of antenna inside the pipe was lost as far as

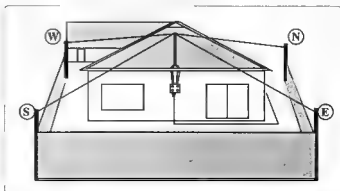


Figure 1: General view of set-up from back of unit.

Continued on page 30

## Geelong Amateur Radio Club - The GARC

Tony Collis VK3JGC



Photo 1: Barry VK3SY receiving the award from Brian Edward.

### Life Membership Award

The club house, whilst owned by the GARC, resides on a reserve owned by the Department of Sustainability and Environment, the DSE. The reserve also houses a Tennis Club and a Pigeon Club from which a joint committee was derived to administer all three establishments.

One of the long serving members of the Reserve Committee, Barry VK3SY was presented with a life membership certificate prior to a recent GARC general meeting.

### Visitors to the club

Doron 4X6YZ is in Geelong attending the Deakin University as a PhD candidate in Public Health



Photo 2: Doron 4X6YZ.

at the School of Medicine. Doran's home town is Tel Aviv and Beer Sheva in Israel but he will be over here for a year.

Also we had a visit from Don VK5BGY, who was in Geelong with his wife Jane for the annual craft fair that takes place in Belmont.

### The GARC Club House

Over the decades since the club house was erected the roof has weathered many storms but finally repairs were necessitated due to leakage through the corrugated roof. The City of Greater Geelong Council was approached with a view to getting a grant towards the costs involved. The Council recently approved a generous grant from their **Councillor Community Grants Program** towards the overall cost of repair, for which the GARC is indebted to them. Work will take place at the same time as repairs are undertaken to one of the two towers that required a new rotator and cabling.

### Our Sister Club W4DOC

Past President Dallas VK3DJ has had many IRLP contacts (node 4550) with the W4DOC committee members and last year paid them a visit whilst touring in the USA. As a result the two clubs are now twinned and we look forward to an involvement with joint competitive activities. Dallas has taken up the role of Liaison Officer on behalf of the GARC. The Atlanta Radio Club web site can be found at [www.w4doc.org](http://www.w4doc.org)



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# Building an 80 metre magnetic loop antenna for your attic

Jim Tregellas VK5JST

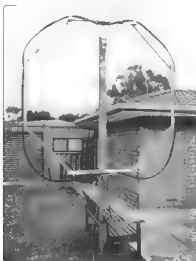


Photo 1: Testing the loop on a temporary frame.

## Part 1

Short of space in your suburban backyard or retirement village? Want a good small antenna for 80 metres? Properly built and sited, this design can perform as well, or better than G5RVs, half wave dipoles, and off-centre fed dipoles, and even better, delivers this performance at the breathtaking height of two metres above ground. And if you are prepared to substitute time for dollars, then it is cheap too. Theory and details are given about how to build one to fit your space.

### The Theory

A magnetic loop antenna typically consists of a circle (or a similar shape with a large central area) of low resistance conductor tuned to parallel resonance with a capacitor. Energy from the transmitter can be coupled into the loop using a variety of techniques and these include the gamma match, an iron dust or ferrite cored toroidal transformer, and a shielded or unshielded single turn air coupled driver coil. A loop perimeter between 0.1 and

0.2 wavelengths gives good efficiency.

If this loop is mounted so that the plane of the circle is at right angles to the ground, the result is a figure eight radiation pattern having two sharp nulls at either end of the axis of the circle. These nulls can be very useful in removing local interference. For best radiation pattern the loop should be mounted with the maximum voltage points (at the capacitor) uppermost and the current maximum which is opposite to the capacitor at the bottom.

The loop has a very low radiation angle and only has to be mounted high enough to prevent the strong magnetic field it produces from inducing significant losses in the ground. At 80 metres this means that there shall be at least 1.5 metres between the bottom of the loop and ground, and also that there is very little extra advantage to be had by mounting it much higher. Of course the loop also needs to be mounted away from metallic objects such as fences, plumbing, garage doors, or the like which will induce currents that can cause unacceptable losses and distorted radiation patterns.

The advantages gained from having such a low radiation angle at a low height cannot be overstated and in this respect a loop is like a vertical. Unlike the vertical however, the figure 8 pattern gives it more gain in some directions and it is less noisy. The 10 metre height restriction placed by city councils on the mounting of antennas means that at 80 metres, wire antennas like the G5RV and half wave dipole can only be legally mounted at a maximum of  $1/8^{\text{th}}$  of a wave length above ground and not the desired minimum of  $1/4$  wave length. This low mounting height results in an antenna that is good for local contacts but poor for DX because most of the energy is radiated almost vertically.

So in summary, the magnetic loop has a very small footprint, is relatively quiet, and is excellent for DX. With only a little extra trouble it can be mounted on a simple rotator that only needs to move through 90 degrees to give continuous coverage in all directions.

For this performance, there is a price. The antenna is really just a large parallel resonant LC circuit which only transmits efficiently when it has VERY low losses. Another way of saying this is that the quality factor of the tuned circuit (Q) must be very high, and typical figures for Q are around 1000 (0.1 % losses). Arrggghh.....

At 3.5 MHz, a Q figure of 1000 means that the antenna has a bandwidth of just 3.5 kHz, which in turn means that the antenna will need continual retuning to cover the ham band from 3.5 -3.7 MHz. So we need a really good method of remotely tuning the antenna, and some simple and reliable method of indicating the frequency to which it is currently tuned.

The losses with which we are so concerned occur in two areas. First there is the loss in the main conductor of the loop caused by 'skin' effect. At low frequencies, current flow occurs uniformly throughout the cross section of a conductor, but as the frequency rises, the rapidly expanding and contracting AC magnetic field which surrounds the conductor forces the current carriers to near the surface. As the current carriers now only move in a much smaller area of the conductor, the apparent resistance rises too. We can lower these losses in a number of ways. First we can use a conductor that is simply bigger (greater surface area). Next we make sure that the conductor surface is smooth and continuous so that current carrier

flow is unimpeded. And last we can electroplate the conductor surface with a material with a very low resistance such as silver. There is another way too, and this is to multiply the surface area available by using a number of smaller insulated conductors in parallel. Insulation is most important because it is this that allows all of the surface area of each of the paralleled wires to be used. Without insulation, a group of wires in contact will simply act like a large single conductor of the same outside diameter as the group, because skin effect forces the current to the outside perimeter of all of the wires.

This idea of multiplying the available surface area by using many small diameter insulated wires in parallel is the basis for the production of 'Litz' wire (short for the German 'Litzendraht') which is used to wind low loss RF coils for items such as the ferrite rod antennas found in transistor radios. It allows us to use the insulated outer sheaths of several pieces of RG8 or RG213 in parallel to make up a single loop conductor with a much larger effective diameter. Being a woven structure, the outer shield of this type of coaxial cable is very rough and in this application has unacceptable RF losses. This is due to skin effect which keeps the current on the outside of the sheath, forcing it to hop from conductor to conductor as one conductor disappears under another in the weave. Each hop involves passing through a resistance where the two conductors contact each other. But with several sheaths in parallel, the losses are much reduced and we have an acceptable engineering compromise. We could use smooth copper water pipe but this is very rigid and difficult to handle. Another alternative is the smooth outer sheath of LDF4-50 or even LDF5-50 semi rigid coax. This cable is expensive and not easy to come by second-hand but of all the possible loop conductor materials it is probably the best compromise for the amateur. Like ordinary coaxial cable, it is flexible. This is an important advantage, because it allows the loop conductors to be

easily placed into the cavity of a non metallic roof where they will form an efficient invisible antenna out of the weather. Such antennas are largely immune to carping comments from wives, neighbours, and governing bodies like councils and those who oversee flats and retirement villages. They are almost free from maintenance too.

The second area of loss is in the capacitor. There are two parts to this, resistive losses and dielectric losses. For efficient operation, a typical loop must have a Q of around 1000, and if we assume that there are equal losses in the loop conductors and capacitor (an unrealistic assumption—see below) then the capacitor must have a minimum Q of around 2000. With a power input to the loop of say 100 watts, we are going to find circulating currents around the loop of maybe 35 amps and peak voltages across the capacitor of around 5000 volts. Qs of greater than 400 are very difficult to achieve, let alone 2000, and so attention must be paid to the smallest details.

Dealing with the resistive losses first, long experience by many loop constructors has shown that normal variable capacitors are useless for loop construction. The sliding mechanical contacts provided to allow RF current to flow from the capacitor frame to the moving plates have losses that are too high to allow the very high Q necessary. In extreme cases, the amount of heat generated in these contacts by the very high currents circulating around the loop can cause physical damage. The result is a poor Q and a loop that is a very poor radiator.

There are really only two types of variable capacitor that are useful, and these are the vacuum variable and butterfly capacitor structures. Both of these exhibit very high Qs, achieved in different ways. In the butterfly capacitor, resistive losses are avoided by having the RF current enter and exit the capacitor via two sets of fixed plates, which are coupled together by a common set of moving plates. No sliding mechanical contacts, and in the best of these capacitors, all the plates in

each of the three sets are welded or soldered together. In the vacuum variable, contact to the moving plates is made via a cylindrical set of copper bellows, which concertina in and out allowing movement, while keeping the capacitor interior under high vacuum. Unhappily, tuning of a reasonable size loop at 3.5 MHz needs a capacitor of around 300 pF. The butterfly capacitor needs an interplate spacing of around 2.5 mm of air to withstand the 5000 volts of RF and consists of two 600 pF capacitors in series. It consequently ends up as unacceptably large AND expensive, while the vacuum variable capacitor is just plain VERY expensive. To keep costs down we need another solution.

The other set of losses in the capacitor occur in the dielectric. These losses are normally measured in terms of the dielectric dissipation factor D, which is the inverse of Q. So if we want a capacitor with a Q of 2000 or more, we have to find a dielectric with a D of 0.0005 or less. The dielectric should also have an extremely high breakdown voltage so that we can put the plates close together and keep the capacitor small. Air and vacuum are excellent dielectrics with near zero losses but finding anything else which is good enough for this extremely demanding application is very difficult to do. To the author's amazement, glass is very poor with a D of just 0.007 or a Q of around 160 and so is utterly useless. In fact there are only two other dielectrics which go close to requirements and both of these are modern plastics. High density polyethylene (HDPE) has a dissipation factor of around 0.0004 at 1 MHz, as does polypropylene (HDPP). Unfortunately these dissipation figures are marginal, because the capacitor really needs to have a Q of much greater than 2000, to compensate for the obviously larger resistive losses that will occur in the very long loop conductors. So if we wish to use plastics at all as a dielectric then we should only do so in a small part of the total capacitance to keep our overall losses down. I have replaced



an air spaced tuning capacitor with a capacitor made up from 16 short paralleled lengths of RG213 to keep the resistive losses way down. RG213 uses pure HDPE as its dielectric. The result of this exercise was a dramatic drop in performance. In short there are no quick and dirty fixes and much of the material published on the Internet about capacitors in particular, and loop construction in general, will produce results that are not worth having.

One other consideration affects the capacitor and this is the accuracy with which it must be set. To cover the 80 metre band, the frequency must change from 3.5 to 3.7 MHz. This is a 5.5%

frequency change, which requires a capacitance change of exactly double this figure to cause it (11%). A butterfly capacitor only moves through a total of 90 degrees of rotation, and so an 11% capacitance change occurs in about 10 degrees of rotation. If the antenna has a bandwidth of 3.5 kHz ( $Q=1000$ ), then to get a good SWR we will probably want to tune it with an accuracy of better than 200 Hz. If 10 degrees of rotation causes a 200 kHz frequency shift, then a 200 Hz shift is caused by shaft movement of a whole one hundredth of a degree! Even if a vacuum variable capacitor is used which typically takes 30 shaft turns to go from minimum to maximum

capacitance, we still only need to move the shaft about one degree to get a 200 Hz shift. So a highly geared slow motion drive to the tuning capacitor becomes absolutely mandatory. It also makes sense to make up the tuning capacitance from a large fixed capacitor in parallel with a small variable unit so that this tuning problem is minimised. In turn this means a monoband antenna, but these loops are small enough to allow you to have an entire antenna farm in your roof cavity. A really efficient loop for 14 MHz is just one metre in diameter! More next month.....

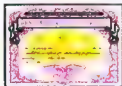


# Remembrance Day Contest

0800 UTC Saturday 13 August 2011 to 0759 UTC Sunday 14 August 2011

The RD Contest provides for amateurs in each state to obtain points for working other amateurs in Australia, PNG and New Guinea, and in so doing contributing points for their state – the overall aim of the contest being to see which state attains the top score in the contest!

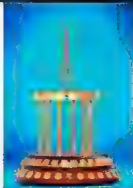
The individual amateur can be presented with a certificate (as pictured) with their name, callsign, the category they entered, and total points scored



The winning state will have their state's name embossed on the perpetual Trophy

The Rules are available for download from the WIA Website  
[http://www.wia.org.au/members/contests/rdcontest/documents/2011\\_RD\\_Rules.pdf](http://www.wia.org.au/members/contests/rdcontest/documents/2011_RD_Rules.pdf)

Peter Harding VK4OD



## Coming Events

**9-10 July**

VK3 – GippsTech 2011 VHF/UHF and microwaves technical conference, Churchill.

**16 July**

VK3 – Gippsland Gate Radio & Electronics Club Hamfest, Cranbourne.

**16 July**

VK4 – Wide Bay Hamfest, Maryborough Electronics and Radio Group.

**31 July**

VK2 – Riverina Field Day, Albury Wodonga Amateur Radio Club Inc.

# Improvements to Jim's RF volt meter

Steve Mahony VK5AIM



The VK5JST RF volt meter as built and modified by the author. Note the 'Battery Check' button on the left hand side of the unit, just above the carrying handle.

Jim VK5TR's RF volt meter is a very useful piece of amateur radio test equipment and it is easy to build. Its other advantage is that all the components are readily available. Jim even provides the catalogue numbers for two electronic component suppliers.

Having built, calibrated and tested mine with a member of the Elizabeth Amateur Radio Club, we were trying to think of an improvement we could make to the unit. After a considerable amount of discussion, Keith, the other builder, suggested a 'battery check' function.

Many readers/builders have built a nice piece of equipment, used it then put it in a cupboard for safe storage only to get it out to use at some time in the future,

only to find the battery flat! How could this test function be added to our RF volt meters?

It is said that two heads are better than one! The circuit is so simple. All you require is a double pole push button change over switch and a resistor as a volt meter multiplier. As it is a 0 - 1 mA meter with 100 ohm internal resistance, the value would be 10 K ohms making it 1000 ohms per volt. All amateurs should remember this from their early electrical/electronic studies.

The circuit requires the positive and negative wires to be taken off the meter and taken to the NC contacts of the switch. Two wires, red and black are then connected from the meter positive and negative to the common of the switch. Two more wires, red and black are then wired from the NO contacts of the switch, the red wire with the 10 K ohm multiplier resistor in series going to the + 9 V of the battery and the black wire to the - 9 V of the battery, the ON / OFF switch is a good place. A red line at the 9 on the 10 V scale gives a reference point.

To check if the battery is OK you just press the push button switch and observe if the meter needle comes up to the red line on the 10 V scale.

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See you at the Albury Hamfest 31 July 2011

# A G's visit to VK

Ian Hollingsbee G3TDT/VK3BIH



*The VK3BIH shack, in the stock yard at the Greta West farm that was the author's VK QTH during his visit.*

I would like to thank the WIA and the many radio amateurs who made my recent visit to Australia so fantastic. It is not often that I can use my VK3BIH call, perhaps every two to three years, but this trip I came well prepared and like the song "I made a hundred in the back yard at Mum's", I made more than a hundred in the stock yard at my QTH. I set my heart on working 100 VKs during my five week stay and accomplished this in just three periods of operating.

In preparation for my visit I purchased the Yaesu FT-857 which was modified to operate on the different band plans. Few amateurs in UK realise, for instance, that in Australia the two metre band plan is different from the 144 – 146 MHz allocation in UK. A lesson I learnt on a previous visit using my European specification VX7. I then made email contact with the WIA who were most helpful in providing me with the Australian repeater lists and other relevant information. Again differences between the countries in that all repeaters in UK have a CTCSS encoder/decoder tone

requirement where there are currently very few in Australia. I programmed the FT-857 memory bank with the 2 m/70 cm repeater frequencies and offsets for those that I thought I might need on my trip.

My QTH in Australia is a farm in Greta West near Glenrowan in northern Victoria, and with lots of tall mature gum trees. I came prepared with a G5RV and small ATU. With a small piece of metal pipe and a spool of nylon line and with several near misses to my head, I was able to get a line over a very tall gum tree with the G5RV attached sloping down to a nearby fence. The 300 ohm ribbon feed was then passed through the passenger seat of the hired car which was to act as my radio shack. I also bought with me a large magnetic mount and a full sized 2 m/70 cm mobile antenna as well as a home brew Slim Jim made out of a piece of 300 ohm ribbon cable. The power was provided by a 26 amp hour leisure battery kindly loaned by a family friend. The antennas, power leads, connectors and ATU all fitted neatly in a brief case placed

into my hold luggage suitcase and the FT-857 was carried in my hand luggage. No questions were asked by customs or security during my travels.

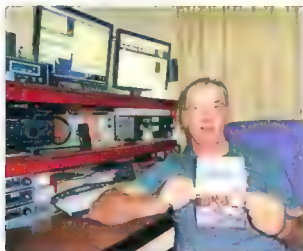
Most of my HF contacts were on 40 metres, not a band I have had much to do with in the past. Having told a few stations that I had set my heart on working 100 VK stations the word must have got about. For the first time in my amateur radio experience I was at the business end of several pile ups. Fantastic is the only word to call it as I worked up into

Queensland, lots in NSW, Canberra, over to South Australia and many contacts in Tasmania, not to mention the many Victorian stations. I found two metres very quiet but had several good contacts through the Wodonga and Shepparton repeaters. No contacts were recorded for 70 cm.

I would also like to thank the Albury Wodonga Radio Club who were simply great, offering me help and advice and inviting me to their Monday night meeting. I also attended their Field Day as advertised in the WIA. I got to know quite a few amateurs at these events and also via the Wodonga repeater during my frequent visits to Albury. It was with great sadness that I dismantled the station and packed it all away in my suitcases - a sadness not to have worked or heard VK100WIA but a joy to find a QSL card from Andrew VK2FAJM waiting in my mail box when I returned home and a joy to have worked nearly 200 VKs. Thank you, Australia.

# The DXer gets back on top

Jim Linton VK3PC



David VK3EW displaying his QSLs confirming the four new 'Netherland Antilles' DXCC entities.

One DXer with a close eye on the changes that happened in the former Netherland Antilles was David McAulay VK3EW, keen to add the four new DX entities created to his tally.

The ARRL DX desk had decided that QSLs for Bonaire and Curacao marked prior to 0400 UTC on 10/10/2010 would be attributed to those former entities, and deleted, while four new DXCC entities would begin from that same point in time.

Like many around the world, and thanks to a flood of DXpeditions, David VK3EW quickly gained the necessary QSLs from all four of them. What he noticed was that no-one had yet filed them with the WIA. A quick chat with WIA Director Chris Platt VK5CP confirmed the four new ones had been passed to WIA Awards Manager Keith Bainbridge VK6RK for his scrutiny and subsequent approval.

David VK3EW said 'Finally the process is complete and once again I am proud to be at the top of the Australian DXCC list.' After submitting QSL cards to prove his latest claim, he now has the WIA DXCC standing of 348/340, the difference in the numbers indicating confirmation of eight deleted entries.



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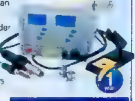
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# Contests

Phil Smeaton VK4BAA

## Contest Calendar for July 2011 – September 2011

July	9/10	IARU HF World Championship	CW/SSB
	16/17	CQ Worldwide VHF Contest	All
	30/31	RSGB IOTA Contest	CW/SSB
August	6	TARA Grid Dip	PSK/RTTY
	7	Wartakere (NZART) Sprint	CW
	6/7	10-10 International QSO Party	SSB
	13/14	Worked All Europe	CW
	13/14	Remembrance Day Contest	CW/SSB/FM
	27/28	ALARA Contest	CW/SSB
Sept	2/3	All Asian DX Contest	SSB
	2/3	Region 1 Field Day	SSB
	11/12	Worked All Europe DX Contest	SSB
	24/25	CQWW RTTY DX Contest	RTTY

*Note: Always check contest dates prior to the contest as they are often subject to change.*

Welcome to this month's Contest Column.

### CQWPX SSB 2011 – Claimed Scores

Claimed scores for VK stations are shown in the sidebar. The write-up for the contest was in last month's AR, but as an addendum, there were a good number of logs submitted from VK for the contest. The bands are possibly enticing a few more onto the bands and for some newer licensed operators, this might be the first time that they have seen some half decent conditions on the bands as they were not licensed previously for the other sun spot cycles.

### WPX CW 2011

From VK at least, the higher bands did not seem quite as ready to play for the CW leg of the WPX contest as they were in the SSB leg a month earlier. Steve VK6IR was on 10 m as VK6HH and had a hard slog getting RF to and from EU. Patrick VK2PN netted just over 700 Qs for a score of just under 1 million, but also found the going to be tough but used 15 m and 20 m to good effect. Steve VK3TDX was also busy on the bands, managing to grab just under 1400 Qs for a score of just over 3 million, with 15 m being the money band for

VK3. 40 m propagation seemed to be quite reasonable and 20 m LP to EU is always good for a Q or two.

Allan VK2GR was active as P29CW for the contest. Allan reports that VKs were overall hard to work and often very weak signal strength, possibly due to long skip. The big EU and NA stations were much stronger than the VKs. Allan enjoyed the quiet QRN conditions – I wonder if he can get any back into his suitcase and import some home to Sydney?

No claimed scores announced at the time of writing, so I will include some detail in next month's column.

John VK4TJ had a spot of bother during the contest, with a few operators not believing his callsign. A few stations insisted that John was called Trent and subsequently his callsign was VK4TI – all because the Super Check Partial database told them so. As always, an operator should log what he or she hears, so a few stations might have a busted call in their log for not listening properly. The use of computer logging assumes that the operator knows what he or she is doing! The whole situation left John doubting the parentage of a few multi-multi operators – a quick turn of the VFO produced an effective remedy.

Callsign	Claimed Score
VK2IM	4,065,918
VK2FHRK	13,676
VK4FJAM	168
VK4FJ	71,248
VK4DMP	66,454
VK2WTT	40,014
VK4MN	7,200
VK3VTH	2,296
VK1MAT	225
VK5FMPJ	4
VK2CA	2,099,454
VK1OO	84,799
VK2HEK	1,311
VK4NM	6,569,696
VK6NC	3,257,260
VK4WIP	1,288,656
VK6IR	2,490,840
VK4KW	27,499,572
VK9CF	634,858
VK4VDX	177,670
VK4ATH	24,552

*VK claimed scores in the CQWPX contest.*

Another 'difference' for this contest, was the approach taken by a small number of stations, in having two signals present on a single band. Whilst not simultaneous signals, it would seem that some operators are adopting an SO2R approach but not across two different bands. Interleaving signals across bands is common practise, but two on a single band will tend to crowd the band even more than 'usual' contest conditions. An effective interlock is required to achieve this – and the Russians have been doing it for quite some time very effectively. However, not only is this a 'game changer' which effectively pushes the multi-single category even further away from the common-sense meaning of those words, but it could come close to doubling band occupancy. During major contests 40 m and 20 m are already stuffed to overflowing and I do not think that the bands could tolerate a situation where all the big

multi-multi, multi-two and multi-single entrants routinely occupied two run frequencies. It is for this reason that I believe that consideration is being given to effectively banning the practice in the CQ WW contests and maybe other major contest organisers should follow suit.

## CQWW RTTY 2010

I am very happy to report that Steve VK3TDX was the Oceania winner SOAB HP for the 2010 RTTY DX contest. Steve gained 1,385,172 points with 1326 Qs, edging out YB0PAH with 1,142,407 points and 1315 Qs. This was Steve's first significant major contest win and Steve deservedly gets the plaque for Oceania HP. Due to a misunderstanding of who was going to sponsor the Oceania plaque, Steve's name did not get printed in the winners listing of CQ Magazine but the contest director confirms that Steve did actually win – much to Steve's relief no doubt. Well done Steve – an excellent achievement.

## New RTTY Contest for 2011

On the subject of RTTY, Muns Vineyard and rtyycontesting.com are delighted to announce a new contest – The 10-Meter RTTY Contest. Nice timing, as the band can open quite nicely from time to time nowadays. The contest will be held for the first time on Sunday, December 4, 2011. The 10-Meter RTTY Contest home page is linked from rtyycontesting.com or can be directly accessed at: <http://www.rtyycontesting.com/the10meterrttycontest.html>.

Beside the Rules page, there is an FAQ and Blog for any comments or questions. Currently, rtyycontesting.com will sponsor plaques for the winning Single and Multi-op entrants. If you are interested in sponsoring a plaque, such as continental Oceania winner, please contact Don AASAU directly. Also, the top ten single operators will receive a bottle of Muns Vineyard California wine.

## VKCC Contester of the Year Award

The VKCC reflector is currently abuzz with discussion on the Contester of the Year Award proposal by Trent VK4TI. The WIA already has a 'DXer of the Year Award' but seemingly it is not awarded every year. The WIA award criteria takes into account many facets of operating, but mainly an operator's activity during the year, and their contribution to DXing, such as contest participation (not necessarily winning), contest support such as managing a contest, and so on.

DXer of the Year awards for the past few years are as follows:

2005 - VK3KE, VK5WO, VK6HD  
2006 - VK4AN, VK3PA, VK3QI  
2007 - VK3DYL, VK2CA, VK3EW  
2008, 2009, 2010 - none awarded

Assessment criteria for a potential VKCC award could possibly encompass:

Highest number of International contests entered - OPEN (mix of all modes)  
Highest number of International contests entered - CW  
Highest number of International contests entered - PHONE  
Highest number of International contests entered - DIGITAL  
Highest number of Australian contests entered

Qualifying contests might include:

HF: Oceania SSB CW, RD, CQ WPX  
SSB CW RTTY, CQ WW SSB CW  
RTTY, VK Shires, John Moyle, Trans  
Tasman SSB CW RTTY, All Asian  
SSB CW, ARRL DX SSB CW,  
VHF/UHF: John Moyle, RD, VHF UHF  
Field Days, Ross Hull

Maybe it could follow the WRTC type of approach with maximum points gained 1000 per contest - Points awarded as:

1st Place 1000 points  
2nd 800  
3rd 600  
4th 400  
5th and below 200

The topic is open to all for discussion, so if you have any input or feel that a given contest has been missed off the list, drop Trent VK4TI a note at [vk4ti@yahoo.com](mailto:vk4ti@yahoo.com) or get onto the VKCC reflector and join in.

## Getting Down and Dirty in Dayton

VK travellers to Dayton might have come across a bit of a problem at the show. The weather was fantastic, no rain all weekend, but Murphy had other things to ruin. As the Hara Arena complex was expanded over the years, the sanitary sewer line was not expanded as a consequence. Because of this oversight, at around lunchtime it plugged, backed up and resulted in a brown geyser at a vent pipe in the main aisle in the midst of the twelve acre flea market. Two septic tank trucks normally used to service the portable dunnies sucked up all the water and mess in the flea market. Then an industrial size cleaning truck was brought in to clear the plugged sewer line – no doubt with aromatic results ensuing. The flea market vendors were moved into a clean area of the flea market, which involved clearing out about 50 flea market spaces. Overall, it was a bit of a mess, but thankfully, no contesters have been reported as harmed during the process. They were probably in the bar, anyway.

If you have any contest related material for inclusion within the column, topics that you would like covered or even some experiences and pictures you would like to share, then please feel free to get in touch via [vk4baa@wria.org.au](mailto:vk4baa@wria.org.au)

See you on the bands.

73 de VK4BAA



# 2011 Remembrance Day Contest rules – see page 34.

# VK3 news Amateur Radio Victoria News

Jim Linton VK3PC

[www.amateurradio.com.au](http://www.amateurradio.com.au)

[arv@amateurradio.com.au](mailto:arv@amateurradio.com.au)

## Review of the year

The gathering at the Annual General Meeting is one of the ways the elected council gets to find out the needs and wishes of the membership.

This year has seen a focus naturally placed upon the centenary of the organisation. It began in 1911 as the Amateur Wireless Society of Victoria and quickly changed its name to the Wireless Institute of Victoria.

To help celebrate the 100 years a draft plan arising mostly from the AGM includes a special callsign and possible award, an associated activation of National Parks and an amateur television event.

November appears to be the most appropriate month to hold most of these events. The centenary branding would of course be launched much earlier and may include other activities.

The membership of the state-wide organisation and the council has until early July to finalise the plan before further steps are taken as we rapidly move towards celebrating our centenary.

## Repeaters getting repaired

Most of the repeaters in the state are maintained by Amateur Radio Victoria. The volunteers involved all have full time jobs and are to be thanked for their work to complete a commercial communications cabinet at the home of VK3RCV, Mt Alexander.

All that is required to finish the work at VK3RCV is antenna rigging and replacement with a 50 watt base station to replace the Philips 828, which has done sterling service over the years.

After building works at the Mt Macedon VK3RMM site both the 2 m and 70 cm analogue repeaters are running. The 70 cm analogue repeater will shortly have a frequency change due to an intermod problem at the site.

Extensive work has been carried out on the VK3RML 2 m and 70 cm repeaters on Mt Dandenong. Recently received is an invaluable MP3 audio file of the intermittent interference being experienced by VK3RWZ, which is at Mt William. A technical solution is now being sought.

The VK3RMK repeater serving northern Victoria is due for an antenna upgrade and a replacement 50 watt base station installed to further enhance its coverage along the Calder Highway. The AGM also mentioned work needed on a few other repeaters around the state.

## Activity in near future

With weeks to go before the International Lighthouse and Lightship Weekend, the set-up by Amateur Radio Victoria is a ready for the Williamstown Lighthouse Timeball Tower located at the Coastal Heritage Park, Williamstown.

The station VK3WV will be on the HF, VHF and UHF frequencies most of the weekend covering 20 and 21 August. If you are thinking of attending, please contact the Event Organiser, Terry Murphy VK3UP [vk3up@amateurradio.com.au](mailto:vk3up@amateurradio.com.au)

The Education Team Leader, Barry Robinson VK3PV, reports that Foundation licence courses will be held on 23 & 24 July, 10 & 11 September, and 19 & 20 November. For more information contact Barry on [vk3pv@amateurradio.com.au](mailto:vk3pv@amateurradio.com.au) or phone 0428 516 001.

## Silent Key Paul Fox ex VK7NOX

Paul was born in 1916 and grew up interested in all sorts of "modern" technology and inventions. He was a keen short wave listener and built many receivers, as well as other gadgets. Electronics was only one of his hobbies. He was a great photographer, and after retiring in 1981 became very interested in woodturning, with some very fine examples of crafted Huon pine to his credit.

After his son Martin left Hobart, Paul gained a Novice licence and he was

able to keep in touch, in the pre-email/Skype era, when Martin was living in other states of Australia, Papua New Guinea and Indonesia.

Paul was a late convert to computers and in 2002 bought his first PC at the age of 84. He attended a few Adult Ed classes and found out all the interesting ways he could use his new toy - digital photography and email being only a couple of the more obvious ones. Paul was given a laptop only a few weeks before he died and was reading a how-to

on Windows 7 so he could best use it.

His time came however, and on 17 May 2011 he died after a short spell in hospital, aged 94.

He was a contemporary of people like Tom (7AL), Terry (7CT), Joe (7BJ) and many others who are now surely welcoming the newest member of the VK7 SK club in the big clubrooms in the sky.

Martin HB9TQX/VK7MM



# The Icom IC-9100 – The all round transceiver

Michael Coleman VK3KH and Peter Freeman VK3PF



Front view of the IC-9100.

Early in 2009, news began to filter out that Icom were planning a new radio that would pack more on board than anything they had previously offered. This radio was rumoured to be a multi mode HF/VHF/SHF radio that would combine many of the features of the IC-746pro (IC-7400) and the IC-910H, into one "box". As with all good stories, the truth never got in the way of speculation. Of course, on-line blogs (including our own VK Logger) and YouTube videos all helped build the hype.

More than two years later the new radio has reached Australia, and your reviewers were excited when offered the opportunity to assess the radio. The radio arrived from Icom, plus the UX-9100 23 cm module and UT-121 D-STAR module were sent as well. They were not installed, as we had requested the opportunity to install them ourselves, and see how easy this was. The radio is double boxed for transportation, but we quickly managed to get it out of the box to have a look at it.

## So, what is on offer?

The Icom IC-9100 is a multi band multi mode radio that offers:

- 1.8 MHz to 1300 MHz in one transceiver
- 100 W on 1.8 to 144 MHz, 75 W on 432 MHz and 10 W on 1296 MHz

- Independent dual receivers
- Modes including SSB, AM, FM, RTTY, D-STAR DV
- Satellite Mode operation
- High stability TXCO
- Two antenna connectors for HF and 50 MHz bands, with an automatic antenna selector and antenna tuner, and one each for 144 MHz, 430 MHz and 1.2 GHz\* are included in the IC-9100 (\*when the optional 1.2 GHz module is installed)
- USB connectivity
- Improved DSP filtering.

## Transceiver design overview

This offering from Icom is a medium-sized base station transceiver requiring a 13.8 V DC power supply. It is reasonably heavy, at 11 kg.

In commercially available amateur transceivers, the heart of performance is usually that of the receiver. In the case of the IC-9100, there are two receivers – Main and Sub. Both use double conversion superheterodyne layout before feeding the IF signal to either the Main or Sub IF and DSP systems. The audio outputs from the DSP systems are then fed to a common audio system. If you have installed the UX-9100 23 cm module, a triple conversion system is used.

The final IF for both Main and Sub bands is 36 kHz, each feeding directly to similar DSP units for all signal processing functions. This includes noise reduction, channel filtering, notch filters, pass band tuning and noise blanking. Optional

*View of the rear panel, with clean layout and plenty of interface options.*



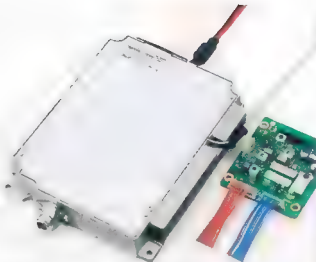
roofing filters (6 kHz and 3 kHz) are optional extras available for the HF/50 MHz.

The two receivers are completely independent, allowing simultaneous reception on any two bands at a given time – but note that all the HF bands and 6 metres count as "one band": You can listen to 50 MHz and any one of the higher bands at the same time, but not to 28 MHz and 50 MHz at the same time. It is therefore unlikely that this is the radio for a hard-core HF operator wanting to monitor more than one band in a single radio. However, the transceiver does perform extremely well as a general transceiver and will suit many operators interested in VHF and above. For each of the Main and Sub bands, you have the choice of two VFOs, allowing rapid change between frequencies and split operation on the main channel. On the HF/50 MHz band, the receiver tunes 30 kHz to 60 MHz, making a useful general coverage receiver.

As one might expect from a modern transceiver, there are many available programmable memories – 99 per band, giving you 396 memories if you have the UX-1200 module installed. In addition, there are 6 scan edge channels per band (18 or 24), 1 call channel per band (3 or 4) and 20 channels for satellite operations.

With the dual receivers, full duplex operation between the Main and Sub bands is a breeze, together with full tracking satellite operation. Add the UT-121 and you have access to all the Digital Voice (DV) D-STAR modes on 2 m, 70 cm and 23 cm bands.

A useful inclusion is an auto antenna tuning unit for HF/50 MHz operations. It will cope with a VSWR of up to 1:3 on all the HF bands and 1:2.5 on 6 m. The transceiver will record in memory the tuner settings for each



*The UX-9100 23 cm module and its IF board.*

frequency range, in 100 kHz steps. For a broader matching range, the IC-9100 can interface with other tuners, such as the AH-4 tuner which will match a 7 m whip or long wire antenna on the bands 80 m and above.

There are many other interface options accessible from the back panel, including external amplifiers, GPS receiver and a USB port.

Those interested in further details can examine the product brochure or download the 202 page operation manual (42 MB) from the internet prior to committing your funds. Included with the radio are a set of circuit diagrams in addition to the operating manual.

### **The radio in operation**

The IC-9100 is a modern looking radio with all black cabinet and knobs. The white lettering on this background made it very easy to read the control labelling. It looks right at home in the shack, and for a radio with so much packed in, takes up minimal shelf space.

The front panel features a large LCD multifunctional display that is easy to read. It shows frequencies on both receivers, the mode in operation, a multi function bar meter, and access to the menu functions.

The manual for this radio, however, is daunting. Two hundred and two pages of necessary reading, especially if you are plan to get the

most out of your new radio. A Quick Guide, either in the front of the manual or as a separate document would make getting it on air easier. It would seem obvious that a radio with so much in it would need a big set of driving instructions! 50 pages are dedicated to the intricacies of D-STAR operations, which can be somewhat daunting for a newcomer.

On the other hand, VK3PF had no problem in exploring the basic operation of the IC-9100, as the radio

controls for band changing and other simple operations are similar to the IC-910H. Of course, a more detailed exploration of any radio will require one to explore the manual as well.

After connecting 13.8 volts and an HF 80 metre/40 metre dipole, it was time to finally tune the HF bands. This was about 11 pm at night and both 80 and 40 metres had no activity. A scan of 20 metres, however, quickly showed that it was open to Europe and the first station encountered was LZ1MS. He was a strong 5/8 (on the 80/40 dipole). The audio from the IC-9100 was really nice and a number of VKs working him gave similar reports to what was being heard.

Engaging the dual receivers and putting on headphones, it was great to be able to listen to two different bands, one in each ear. You can adjust the volumes individually, and if you want to concentrate on one band, disabling the second receiver gives you one band in both ears. Nice!

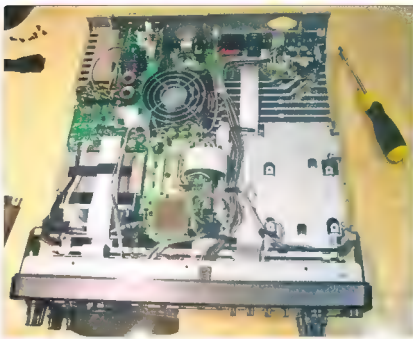
As 144 MHz was on the second receiver, it was time to look for local beacons. The VK5RSE two metre beacon at Mt Gambier was 549, a distance of over 380 km. A listen with the "usual" radio on the same antenna produced a 539 report. The audio on the IC-9100 was also more natural.

Over the next few weeks, contacts were carried out across all the bands. The noisy 3.5 MHz and 7 MHz band really showed off the improvements in the DSP on this radio. By selecting and adjusting the right filter the DSP made a big difference. It was able to pull an unreadable signal out of the S9 noise, and there seemed to be less "ring" than with the DSP on predecessor radios like the IC-7400.

Transmit audio reports were always very positive, and the default setting on the Compressor produced surprising compliments. Often compression circuits can produce an overdriven sound, but the Icom seemed to be able to produce noticeable punch without any apparent side effects. You can always get in to the radio's copious menus and adjust the audio till it overdrives, if that is what you want!

One noticeable feature was the excellent receive audio quality. The sound from the in-built speaker was clearly "rich" from the start. During later exploration of the receiver performance, the standard settings were used to feed the Spectran audio DSP software package. Listening to a weak distant 2 m beacon, it was clear that the receiver audio passband was very flat in its response, with very fast roll off at the edge of the passband – demonstrating the excellent performance of the DSP system in the receiver. Of course, one can adjust the receive passband characteristics via the DSP controls.

It should also be noted that strong signal performance was also excellent. Whilst listening to the VK3RED beacon on 144.436 MHz at about 10 dB above the noise, we heard clear key clicks from the VK3RGI beacon on 144.434 MHz. The keying on VK3RGI could be better, and VK3RGI was at least 60 dB stronger than VK3RED. We were pleasantly surprised – the receiver performed very well using the default settings, considering the characteristics of VK3RGI with its much stronger signal only 2 kHz away. If we had wished, we could have significantly reduced the



*Bottom view of the IC-9100, ready for the installation of the 23 cm unit.*

VK3RGI signal using some of the many DSP controls in the IC-9100.

As previously mentioned, the 1200 MHz module was supplied separately. We asked for it this way, as it would allow a look inside, and an opportunity to see how easy the install was. Inspection inside the unit showed extensive diecast aluminium used in the chassis for heat dissipation, plus a large fan over the Power Amp section. The only time the fan was noticed was whilst using FM on two metres.

Installation was really straightforward, and the instructions were adequate to ensure everything went smoothly. Install time was 25 minutes, although it was delayed a little as we took some photos which we have included in this report.

Once installation was complete, a pair of 36 element 23 cm Yagis were connected, and some country beacons were checked. The VK5SRE beacon was 519 at 380 km, and the Ballarat 23 cm beacon was 599 at about 100 km. The receiver definitely works well!

This radio also has a D-STAR DV option, although time did not allow this to be checked out.

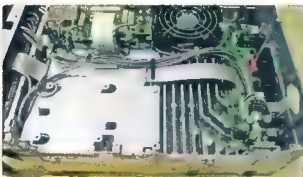
The only real disappointment with this radio was the inability to set power output at different levels on

different bands. This was the same on the IC-746 series (IC-7400) and the IC-910H, and it is frustrating if you want to follow the radio with external power amplifiers that require different drive levels. In addition to this, the Power Output meter is only calibrated as a percentage of total output power, so if you want to run QRP at 10 W on 3.5 MHz, you set the power to 10% output.

## Technology

Our hobby has become more diverse over recent years, as computer technology is embraced both in radio transceiver design and in operator's own lives. Computers and the internet have meant more operators have begun to explore how they can control their radios in ways never before possible. Also new modes, including the growing list of Digital modes, mean that amateur radio operators are finding many new means of making a QSO. The growing number of operators who now have made successful EME contacts on 2 metres using JT65b is a classic point in case.

The Icom IC-9100 incorporates this technology, and allows access to these new modes that more amateurs are exploring. It does this by incorporating a USB port



The location for the installation of the UX-9100.

for connecting your radio to your computer and the internet.

This brings up one minor issue. Frequency stability can be important for some of these weak signal digital modes. For most operators, the IC-9100 will probably be adequate for 2 m and 70 cm operations on digital modes.

Measurements on the 2 m band simulating JT65 operations (almost 50 seconds transmit time in each 2-minute period) showed a shift in frequency of only 5 Hz after each transmit period. One would therefore expect a shift of approximately 15 Hz on 70 cm and 45 Hz on 23 cm.

In the IC-9100, frequencies are generated from a single 30 MHz high stability oscillator driving the Direct Digital Synthesis units in the PLL unit. The system shows a period of drift during warm up, as do most transceivers. However, our measurements show good performance after this initial warm up period for most typical operations.

Some of us are happy to explore the limits of weak signal VHF and UHF performance using the digital modes and might seek to have better stability than the already excellent performance of this transceiver. I wonder if Icom might consider making available an optional module allowing the use of an external high quality frequency source (such as a 10 MHz source like a Rubidium oscillator or GPS-locked TCXO)? All that would be needed would be an adequate injection level (perhaps a buffer circuit) and a tripler and filter prior to injection of the 30 MHz at the appropriate place on the PLL unit. My guess is that there may be some

potential users out there willing to possibly void their warranty if they find that their requirements are not met by the existing PLL unit.

If you are looking for remote control, Icom have even covered this with optional RS-BA1 Remote Control Software, enabling the radio to be controlled from elsewhere in the house/shack, or anywhere in the world where you can access the internet. Also available is the CS-9100 cloning software package, which allows one to program settings, memory channels and set mode contents easily from a PC via the USB interface.

### Summary

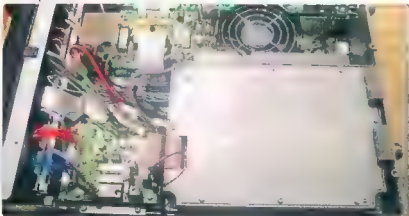
It is state of the art, it is nicely set out, and once you have learnt your way around the amazingly in-depth menus and controls you will be able to enjoy whichever part of our diverse hobby you personally want from it. Whether you are a lowbender, a HFer, a VHF/UHF FM operator, a weak signaller or an aspiring microwaver,

this radio will cover your needs. It will also allow you to go to other parts of our hobby you may not have previously explored.

At around \$4000 (without the 1200 MHz option, which costs approximately \$650) it will not be for everyone, but if you are looking for a base station radio that will cover all your normal operating requirements, incorporates the latest technology and gives you new frontiers to explore, then no other radio offers you what the Icom IC-9100 can offer you. Interestingly, one Australian retailer reports that 85% of purchasers were adding the 1200 MHz module and the D-STAR DV option (\$279). Covered by a five year warranty, Icom are confident that this radio will prove very reliable. Judging by the high level of take up, and the back orders for stock, it seems that many Australian amateurs have already made their decision.

We thank Icom Australia for the loan of the radio.

The UX-9100 module and IF board installed, ready for the radio bottom cover to be replaced.



Band	FM	SSB
144 MHz	0.08 mV MDS	-148 dBm MDS
432 MHz	0.08 mV MDS	-148 dBm MDS
1296 MHz	Not measured	Approx. -150 dBm MDS

Table 1: Receive sensitivity tests on the test transceiver on the bands 2 m and above, using a calibrated HP signal generator for 2 m and 70 cm. The figure for 23 cm is estimated from the second harmonic from the signal generator. These figures are excellent for these bands.

# VHF/UHF - An Expanding World

David Smith VK3HZ  
vk3hz@wia.org.au

The main activity of note this month surrounded the meteor scatter activity associated with the Eta Aquarids at the start of May. Adrian VK4OX/VK2FZ was active over this period and had some interesting contacts. He writes:

*According to the OH5IY Meteor Scatter Predictor, the Eta Aquarids this year were predicted to be active between May 1 and 8 with the maxima on the 6<sup>th</sup> at 1250 Z  $\pm$  48 hours. OH5IY predicted the best times for the VK4 to VK3 path as between 0000 Z to 0100 Z.*

*During the best time period, I started by listening for the VK3RGL 144.530 MHz beacon. I have 144.5293 MHz USB stored in a memory so it is then just a button press to get to the main operating frequency. This is not ideal but I do not have a second receiver.*

*When the beacon appears, I switch frequency and call, coming back to check to see if the beacon is still burning. Some of the beacon burns were very weak. Sometimes I was not even sure it was the beacon burning but I call just in case. I used a headset with a boom microphone and a footswitch for PTT. A second receiver would make it much more relaxing - I have to be poised over the memory button so as not to lose too much time switching between frequencies. This can be tiresome after an hour or so but all good fun!*

*This is a summary of the events over the period. Please see table above.*

*The OH5IY predictor proved quite good although the predicted max of the 6th was quite poor with days before and after much better. I believe this just to be bad luck! The predicted best time of 0000 Z to 0100 Z for the VK3 to VK4 path was spot on.*

*I worked ZL3TY on FSK441 on the 4th 1900 Z-1945 Z (2407 km) which was quite a stretch for MS. We tried again 24 hours later but no*

2011-05-01:	Hardly a ping.
2011-05-02:	Hardly a ping.
	2111 Z - 144.071 CW VK2BCC 800 km
2011-05-03:	One 30 sec burn, five minburns (1 - 2 sec) and 9 pings
	0044 Z - 144.200 SSB VK3HY 1420 km
2011-05-04:	Three 30 sec or longer burns, one minburn, 11 pings
	0016 Z - 144.200 SSB VK3HY
	0036 Z - 144.200 SSB VK3HY
	0055 Z - 144.200 SSB VK3HY with incomplete VK2BCC
2011-05-05:	One 5 sec burn, two minburns 9 pings
	0047 Z - 144.100 SSB Incomplete VK3HY and VK3II
	2347 Z - 144.100 SSB VK3HY and incomplete VK3II
2011-05-06:	Zero burns, zero minburns, 11 pings
2011-05-07:	Two 30 sec burns, one 10 sec burn, four minburns, 14 pings
	0020 Z - 144.200 SSB VK3DUT 1311 km two long burns and two excellent QSOs
	2133 Z - 144.200 SSB VK3VFO 1406 km
	2149 Z - 144.200 SSB VK3AMZ 1458 km
2011-05-08:	Did not clock
2011-05-09:	One 60 sec burn, one 12 sec burn, one 8 sec burn, 1 ping.
	0058 Z - 144.100 SSB VK3HY and VK3II 1469 km

*go and again another 24 hours later and still no go. That was Saturday morning and ZL3TY worked quite a few VKs with distances of 2000 km - we just could not get the extra 400 km. ZL3TY commented on the long burns and many pings occurring. I was monitoring VK3RGL at this time and there was hardly a ping from it.*

*The VK3RGL 144.530 MHz beacon is a fantastic source of pings (I believe 7 watts to a 7 dBi Yagi). This takes the guesswork out of meteor scatter work. The big long burns can have a huge footprint extending as far north as Sydney (VK2BCC), east to at least VK3DUT, and west to I-don't-know-where. A pity no VK7s were on to test that path.*

*Thanks to all who took part and to those responsible for VK3RGL on 144.530 MHz.*

## VK9NA/ZL1TPH Records

The VK9NA DXpedition over summer resulted in quite a few new records. In particular, the contacts with Steve ZL1TPH over a distance of 747.5 km, reported in a previous column,

resulted in four new VK records and six new ZL records listed below:

### VK Records:

New VK9 record for 3.4 GHz  
New VK9 record for 5.7 GHz  
National 2.4 GHz Digital Modes record  
National 5.7 GHz Digital Modes record

### ZL Records:

National record for 2.4 GHz  
National record for 3.4 GHz  
National record for 5.7 GHz  
National 1.2 GHz Digital Modes record  
National 2.4 GHz Digital Modes record  
National 5.7 GHz Digital Modes record

Congratulations to all involved.

## Roof Mounted Antenna

David VK3ZJG is returning to activity on VHF after a hiatus of a few years. His current situation does not lend itself well to a tower and so he has designed a through-the-roof mounting system for the antenna



Photo 1: Antenna support pipe.



Photo 2: New antenna in place.

pole. The rotator is mounted on the ceiling joists and a 1.3 m sleeve of 2-inch water pipe is secured to the roof trusses and pokes through a hole in the tiles. The mast is a 6.5 m length of 48.3 mm tube with 3.2 mm wall thickness.

He had a recent antenna raising party where, with the help of a cherry-picker, the mast was put in place, complete with 10-element 2 m Yagi and coax run. A 6 m Yagi will be added in due course, which can be done with the pole in place. Of course, all work on the roof (2 storeys up) was done with the appropriate safety harnesses, anchor points, etc.

Expect to hear more from David as he develops his station, with the next step planned to be an increase in power from the current 10 W.

Please send any Weak Signal reports to David VK3HZ at vk3hz@wia.org.au

## Digital DX Modes

Rex Moncur VK7MO

### ISCAT-A Tests

David VK3HZ and Rex VK7MO have been testing a further revision, r2433, of the new experimental mode ISCAT-A, in WSJT9 for 10 GHz aircraft scatter. The test results have been very promising with 10

GHz QSOs completed from VK3ES's QTH near Mt Macedon Victoria to QF18 near Willcannia NSW (656 km), QF19 White cliffs NSW (733 km - new 10 GHz digital record) and QF48 north of Dubbo NSW (703 km). The QSOs to QF18 and QF19 used the Sydney to Adelaide flights which cross at near right angles resulting in Doppler variations of up to 1000 Hz per minute. ISCAT-A copes well with these large Doppler variations, firstly because its bandwidth is limited to 900 Hz allowing more than 1000 Hz variation in a typical SSB passband and secondly by using inbuilt Costas arrays to provide AFC correction for Doppler. Wikipedia describes Costas arrays as follows:

*"In mathematics, a Costas array (named after John P. Costas) can be regarded geometrically as a set of  $n$  points lying on the squares of a  $n \times n$  checkerboard, such that each row or column contains only one point, and that all of the  $n(n-1)/2$  displacement vectors between each pair of dots are distinct. This results in an ideal 'thumbtack' auto-ambiguity function, making the arrays useful in applications such as sonar and radar."*

In the case of ISCAT-A, it uses a 3x3 Costas array (i.e. a sequence of three tones representing the array) transmitted approximately each second which is used to synchronize the timing of message tones and provide a frequency reference to decode the message tones and provided AFC.

A features of the new revision is that it searches each received wave file looking over periods of 2.2, 4.4 and 8.9 seconds and decodes the period that gives the most confidence. Thus if the signal gives only a short burst of 2 seconds this will decode in preference to a longer period, but if the signal gives a weaker but longer burst of around 9 seconds or more this can be averaged to decode the weaker signal. Good decodes have been achieved with weak signals of several seconds down to -15 dB.

Please send any Digital DX Modes reports to Rex VK7MO at rmoncur@bigpond.net.au

## The Magic Band - 6 m DX

Brian Cleland VK5BC

I am preparing these notes from Darwin where I am attending the national WIA AGM. This has given me the opportunity to meet many of the Darwin 6 m operators including Mark VK8MS, Richie VK8RR, John VK8JM, Stuie VK8NSB and Trevor VK8TH and to hear many stories of the 6 m DX experienced from Darwin.

Mark VK8MS reports:

The TEP season in Darwin started 12 Feb at 1308 Z with JA2IGY/b 519 50.010 and JR6YAG/b 519 50.037. Then 14 Feb Willem DU7PAOHIP was in at 1325 Z at 5x9, we then worked Willem almost every day up until him leaving to go back to Europe on 30 April.



Photo 3: At the WIA AGM dinner Richie VK8RR showing David VK5KC a QSL card from 4X4DK, who he had recently worked on 6 m.

Most evenings from 15 Feb: many JAs were worked on TEP with Hilde JR6EXN being the most regular.

On some exceptional days very busy we were working into JA, KH2, 9W6, VR2, DU1 and 7, BV, BA, YB, XV and by the end of March we were having regular TEP contacts with all the Asian countries. The main video we were hearing was the 49.749.6 MHz and 49.750 MHz carriers and warbler every evening with the DU TV on 55.249.6 MHz also most evenings.

Then following the equinox things started to change around 29 March, we started to hear the 48.259.7 MHz, 48.250.5 MHz and 48.251 MHz video from the Middle East with the Dubai TV on 48.250.7 MHz coming in most evenings.

Then on the afternoon of 5 April at 0756 Z, I worked KH6SX Art on 50.110 CW 519, the first time worked for seven years and then following him at 0824 Z worked Fred KH7Y on 50.106 CW 519. Early in the evening at 0916 Z 48250.7 Dubai TV came in S9 for the next hour; no amateurs. That evening many JAs, BV9BU and Eddie DU1EV were worked.

6 April at 0635 Z Fred KH7Y 5x9 SSB and also Art KH6SX 5x5 on 50.132 SSB and that evening at 1027 Z Joel KG6DX 599 CW followed by a pile of JAs also on CW and at 1058 Z worked Shin DS2KGJ 5x7. That evening typical TEP with DU1EV, BD9BU, DU7/PA0HIP, VR2XMT, YB9AY, 9W6RT, BV2NT all worked. As the many JAs and Asian stations started to disappear the 48.250.7

VK to Bahrain contact on six metres with Dave A92IO 5x9 both ways 9680 km to LL56fe (Dave commented that this is the first official VK-A92 six metre contact as they only gained privileges in 2010).

Dave was in until around 1500 Z then the Asian TEP picked up with YF100-B 559 and JAs starting to come back in again; the next few days saw the same TEP with many Asian stations being worked.

8 April at 1049 Z Dave A92IO was back in again but this time at 1146 Z 4X4DK, 4Z1TL.

9 April Dave A92IO was again in at 5x7.

10 April 0705 Z worked Jeff NH7RO for first time for many years at 5x1 and at 0754 Fred KH7Y at 5x8.

12 April it was good to work Chris A45XR in Oman 559 50.105 CW again. Then that evening typical TEP and regular evening chat with Willem DU7/PA0HIP and George DU1GM. The Pacific and Middle east now dropped off but most evenings TEP to Asian region except 15 April when Dave A92IO was back in 519 on 50.109 CW and 25 April Fred KH7Y 519 to 559 CW on 50.110.

Had thought that was not a bad TEP and F2(?) enhanced season but TEP stayed in most evenings and on 2 May at 0531 Z had Bert KH6HI come in on SSB 5x2 for a chat followed by Fred KH7Y.

Well after this it did drop off and noticed many stations dropping off the DX Summit sites etc.

As the sun moved further north

MHz Dubai Video started to become stronger and at 1420 Z I was just checking some mail and about to go QRT as it was getting late all of a sudden when A92IO starts calling 5x9. Of course I could not grab the mic quick enough so had the first

there has been the odd evening with 49.749.6 MHz video and 55.2496 MHz pretty quiet until today, 29 May, winter Es came with 0730 Z VK8RAS/b 599+10 50.046.7 CW with David VK5AYD in Coober Pedy 5x9+10 at times. David was in for a few hours then at 1045 Z 49.749.6 MHz video and warbler 59+10 and 48.249.7 MHz 55 and then at 1050 Z JR6EXn 5x9+10 and at 1052 Z JA4UDN 5x7.

So in concluding, TEP and winter Es still around.

Thanks Mark for the extensive report on 6 m activity into Darwin and well done with the A92, will be very interesting to see what next year brings.

Whilst in Darwin I also had a chance to catch up with Gary VK4ABW who has recently been transferred to Darwin with his employment. Gary already has a 5 element Yagi up and has managed a few TEP contacts.

Also found another keen 6 m operator in Darwin in Mike VK2BZE who says he will probably be here until early next year. Mike said that on a recent trip back to NSW he worked Willem DU7/PA0HIP while mobile south of Darwin over a 3-hour period giving Willem several new grid squares.

Looks like there will be many active 6 m operators in Darwin in the next 12 months.

Whilst in Darwin, I had a listen on 6 m using my 5/8 2 m vertical and other than working the locals did manage to work David VK5AYD in Coober Pedy during the E opening on 29 May with signals up to 5/6.

From southern VK there has been very little to report, the only major activity being a good opening from JA to VK3 and VK5 on 2 May. In VK5 many JAs were worked from call areas 1, 2, 3, 6, 9 and 0 between 0630 Z and 0730 Z.

Please send any 6 m information to Brian VK5BC at [brancleland@bigpond.com](mailto:brancleland@bigpond.com)



# Adelaide Hills Amateur Radio Society

Christine Taylor VK5CTY

I am writing these notes in Darwin after a wonderful weekend of activities at the WIA AGM. The Darwin Amateur Radio Club hosted the weekend, which has been a great success. The weather has been perfect. I am sure there will be other reports in the magazine.

The Club May meeting was presented by John VK5EV. John spoke of his work in amateur seismology. John has put together an array of equipment at home which allows him to record earthquakes, his results are much sought after by the professional bodies. Thank you John.

Our June meeting was a talk by Peter VK5TZ on solar electricity generation. The talk is considered timely as the solar rebates are to be reduced soon and this may spur others on to install solar arrays in their homes. July 3 will be the Club mid-year dinner and which will be held at the Fresh Choice restaurant, and is expected to attract over 40 members.

Last month the Club signed an agreement with the Blackwood Guides to use a shed on their premises. Work is progressing rapidly on the refurbishment. Barry



Photo 1: Barry VK5BW and Roy VK5FROY "measuring up".

VK5BW, Roy VK5FROY and a merry band of helpers have stripped the inside, placed timber battens round the wall, rewired the power, and are now ready to insulate and then Gyproc the walls. It is around 50 square metres, not large enough for monthly meetings, but will be used

for training, committee meetings, projects and a club station will be set up there. The property is on several acres in Blackwood and will allow suitable antennas to be erected. It is not very easy these days to obtain premises for exclusive use.

The Club has become involved with a group commemorating the centenary of the Titanic sinking. Their website [www.1912theevent.com.au](http://www.1912theevent.com.au) explains it well. The group approached us for a Morse code demonstration. We have obtained the call sign VK5MGY for the year - MGY being the call sign of the Titanic. Doc VK5BUG, an avid CW operator will be using the call with others over the next 12 months. A QSL card will be printed.

The club meets on the third Thursday at the Belair Community Centre, Burnell Drive Belair. Meetings commence at 7.45 pm. Visit the club website for more information [www.ahars.com.au](http://www.ahars.com.au) Or contact the president David VK5KC at [vk5kc@wia.org.au](mailto:vk5kc@wia.org.au) or the secretary, Sue VK5AYL at [vk5ayl@wia.org.au](mailto:vk5ayl@wia.org.au)



Photo 2. Rest time for the helpers.

# VK2news

Tim Mills VK2ZTM  
vk2ztm@wia.org.au

The next major event in Sydney will be the annual auction of the **Waverley Amateur Radio Society** on Saturday morning July 9 at their club rooms in the Scout hall in Vickery Avenue, Rose Bay. Details on vk2bv.org Their AGM was held in April with little change in positions. There is to be a weekend of assessments on 10 and 11 September: [education@vk2bv.org](mailto:education@vk2bv.org) See page 36 of June AR for more details. The **Wagga Wagga & District ARC** held their AGM last month on 24 June at their club rooms in Small Street. For **WICEN** personnel, the annual Bush Walkers NavShield is on the weekend July 2 and 3.

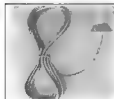
The **St. George ARS** are celebrating their 40th anniversary. Their special event callsign **VK40SGARS** runs until the end of July. They 6800 repeater at

Heathcote in southern Sydney returned to service late May on a standby antenna until repairs to the main antenna could be carried out. The Thursday evening net has also returned to 6800 after a period on the 6650 Mt. Bindo system. For their monthly meeting in June, they paid a visit to the Sydney Telstra Museum. This museum is located at 12 Kitchener Pde, Bankstown – phone 02 9790 7624 – [tmuseum@bigpond.net.au](mailto:tmuseum@bigpond.net.au) It is open a couple of days a week. Well worth a visit.

The **Oxley Region ARC** held their annual field day last month. The Club's technical team recently replaced the equipment for their **VK2RPM** 6700 repeater. The **VK2RPM** site located between Port Macquarie and Taree has repeaters on 2 and 70. Improved receiver sensitivity has forced the introduction

of a 91.5 Hz CTCSS tone on 6700. The 70 cm **VK2RPM** – 438.525 - repeater requires a 123 Hz CTCSS access tone. At their other repeater site – **VK2RCN** – located north west of Port Macquarie, a 70 cm repeater on 438.425 MHz has been commissioned. It also requires a 123 Hz CTCSS tone. The two metre repeater at **VK2RCN** is on 147.000 MHz. No access tone is required on this one. **ORARC** is currently celebrating their 50 years and has a special event callsign **V140BOR** until the end of October. Early October will be the celebration of the founding of the club, based in Port Macquarie on the NSW Mid North Coast. The mid-week evening net on 6700 has been shifted to Tuesday at 7.30 pm. For more on the Oxley Region ARC and the celebrations check out [www.orarc.org](http://www.orarc.org)

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The **Blue Mountains ARC** held their AGM in May with changes in the office bearers. The new President is Richard VK2WAY, who also has Education; Vice President Andrew VK2XPT and is also web master; Treasurer John VK2VJA; Secretary Felicity VK2GRR. The committee has Carl VK2HRC, Alf VK2YAC and Erik VK2MAN. Publicity and Ragchew is with Danny VK2FDAC. Tony VK2HO is the repeater manager. Historian Daniel VK2DC and HF nets Dennis VK2RM. The BMARC are still looking for a new club house and once found they will start arranging Winterfest 2011.

The **Hellenic Amateur Radio Association of Australia** will be operating the VK9HR Expedition on Lord Howe Island from July 24 to August 2, 160 metres through to 6 metres. More information on [www.vk9hr.com](http://www.vk9hr.com) or Tommy on 0413 005 511 or [president@haraca.com](mailto:president@haraca.com)

On Sunday 31 July, the **Riverina** field day will be held in Lavington (Albury). It will be provided by the **Albury Wodonga ARC** at the 1st Lavington Scout Group Hall in Mutch Street, Lavington. Start time 10 am. A range of traders are to attend along with table sales. Need a table? Email [vk2ast@wia.org.au](mailto:vk2ast@wia.org.au) or for further details go to [www.shutupmatt.com/AWARC/](http://www.shutupmatt.com/AWARC/)

The club has a business meeting on the first Monday at 1930, a

workshop night on the third Monday. Both held in the science room of the Murray High School, corner Kaitlens Rd and Kemp St. Lavington. See June AR page 48 for information.

For decades the **Illawarra ARS** has conducted the Lawrence Hargrave Award. They will be holding a BBQ / picnic on Saturday 10 September, with some fox hunts thrown in. Don't forget the crystal set construction competition for the rest of the year. They also provide the VK2RDS D-STAR repeater from the Maddens Plains site on 2, 70 and 23 cm. It provides good Sydney and Illawarra Region coverage and is jointly sponsored by the Society, the WIA and Icom Australia. The monthly meeting is held on the second Tuesday evening. They have an extensive library for members. All their activities can be found at [www.iars.org.au](http://www.iars.org.au)

The **Hornsby & District ARC** is on the upper North Shore of Sydney. With a membership a bit over one hundred, they held their AGM late in May. President John VK2ZOI having held that position for a couple of decades, chaired the thirty fourth AGM and was re-elected as President. John said it would be his last year, some members said they had heard that comment before. Vice President is Rod VK2DAY; there is a new Secretary with Bob VK2ZRM taking over from Dot VK2DB

who stood down after many years in the position. Andrew VK2TAN continues as Treasurer. There is Justin VK2CU and Mark VK2BMW as committee members. Other positions are decided by the elected committee and will be advised in their magazine QUA. Monthly meetings are the second Tuesday (informal) and fourth Tuesday (monthly) at Mt. Colah.

On the last Sunday this month (31 July) the **ARNSW Trash & Treasure** will be conducted at the VK2WI Dural site - 63 Quarry Road - starting about 9.30 am. During the morning licence assessments will be available. You can obtain details via the ARNSW office phone 02 9651 1490 or the Secretary's mobile 0400 445 829. The early afternoon has the Homebrew and Experimenters Group with their technical gathering. Check out the web site at [www.arnsw.org.au](http://www.arnsw.org.au)

There are on-going improvements at the Dural site and one project is to complete the boundary fencing. This is a call to members who might like to do a 'bit of bushwalking' and help erect the final sections round the rear of the property. This will mainly be 'belting' in the steel posts and then feeding the wire into the posts. If fencing is your calling - please get in touch with the ARNSW committee via the office telephone.

73 - Tim VK2ZTM

## An improvement to the hidden 40 metre X beam Continued from page 10

radiation was concerned. The two metre pipe is still hidden from the front of the unit. In the new arrangement the centre section of the antenna legs are far enough apart to form vertical radiators. In my present arrangement the inside end of the legs are anchored to the base of the vertical pipe and then go over the guttering but I think the way shown in the drawing may be better.

The control box is now larger, with the four sockets on top and a variable capacitor across the director sockets. To date I have not been able to discern any improvement with this arrangement but when I can organise tests to determine where the lobes are this may be possible. With the original system, tests with VK5KLT suggest that the lobes are distorted, probably by the proximity of the north and west legs to the roof of the unit.

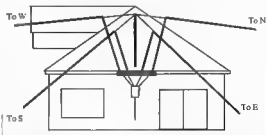


Figure 2: Detail of change with inside end of antenna legs. Heavier lines represent the antenna, the thin ones from the top of the pipe are one metre long sections of nylon fishing line. Where the wires cross the guttering a length of PVC pipe is cut length-wise and slipped over the guttering edge. The wires are attached to this by looping through small holes.

Now that we have passed the halfway mark for 2011, it is time to give some thought to the opportunity of participating in next year's YL International Meet. This is an opportunity that will not be repeated in the near future unless people are willing to travel overseas to be a part of further International Meets. A lot of work has gone into the planning of all the events which will take place over the seven days and it would be such a pity to miss the chance to meet with not only YLs from all Australian States but to greet YL visitors who will be arriving from overseas for the Meet.

Our thanks go to ALARA President Tina VK5TMC and her band of helpers who have given so much of their time to organizing the event. The following is an update of information.

## YL International 2012 Meet, Adelaide Australia

From Tina Clogg, Organiser and ALARA president

We already have 32 registered participants for the Meet. Expressions of Interest have been received from a further 46. If you hope to join us please let me know as there are many DX YLs who are thinking of coming but have indicated they are hesitant because their friends are not on the list of hopeful attendees.

We now have the final quote for the Adelaide portion of the YL International 2012 Meet. The total is \$730 (Made up of \$50 registration and \$680, the balance) for the Meet. Accommodation costs are in addition to that.

Some YLs have been asking for more information about the motels. They are all about the same standard except the Grand which is 5-star. The Marina Comfort Inn is the closest to restaurants and other facilities at Glenelg. Pick up from the four places organized by us and



Photo 1: The VK5 Working Party for the International Meet.

transfers for the conference and dinners have also been organized. Most motels and hotels charge for internet connections in Australia. They all have en-suite bathrooms, coffee and tea making facilities and a refrigerator.

Registration fees can be paid any time with a deposit of \$300 per person due by 30 September.

For the Ghan trip, a deposit of \$500 is due when you book or when we receive the final quote. I have a registration form, payment instructions and itinerary in pdf format. If you have any questions please do not hesitate to ask.

For those who are on FaceBook, I have created a FaceBook identity just for keeping in touch. I am keeping the web page up to date and it is at <http://www.ylinternational2012.com>

I look forward to receiving your registration and seeing you in 2012.

## Cost Summary

Registration fee (non-refundable) \$50.

Main Meet \$680 pp.

Motel accommodation with breakfast \$560 pp

**NB:** Quoted Price Twin Share – Can vary depending on your choice

**Adelaide Meet Only \$1290**

Optional 9 day **Ghan Tour \$5000**

Total for 15 day Meet and Tour \$6290.

## ALARA AGM held on 2 May 2011

### From the Minutes

There was a very good roll up with 20 ALARA members participating. The meeting was chaired by President Tina VK5TMC.

Nomination of office bearers: As listed in the ALARA Newsletter Moved Jenny VK5ANW, Seconded Shirley VK5YL. Accepted.

It was with regret that we accepted the resignation of Susan VK7LUV as Secretary, for personal reasons. Tina thanked Susan for her time on the committee, especially her years as President, and more recently as Secretary. For the time being Shirley VK5YL and Tina VK5TMC will share the Secretary's position which will be advertised in the next Newsletter.

Tina VK5TMC welcomed the following new members to the committee and thanked them:

Susan VK3UMM becomes the new Public Officer and Lyn VK4SWE has taken over the role of VK4 Representative.

Tina thanked the past committee, in particular outgoing Office Bearers, Lesley VK5LOL for her time as Senior Vice President; Robyn VK3WX for her times on the committee, most recently as Public Officer; and especially Margaret VK4AOE for her time as Treasurer, and all the other offices she has filled over the years. She also thanked the on-going committee members for their work over the past year. And particular thanks went to Dot VK2DB for her tireless efforts in producing the Newsletter for nearly 20 years!

## News from VK3

The VK3 ALARA members attended a luncheon which was held at the Chelsea Heights Hotel. There was a good attendance with approximately 18 people there. The meals were enjoyable and varied and the conversation flowed. These lunches provide a wonderful opportunity



*Photo 2. ALARA lunch.*

to catch up with friends who live some distance away or who may not have the opportunity to attend the lunches regularly owing to work commitments. Everyone looks forward to the next ALARA lunch in July.

Susan VK3UMM advises that GGREC has just elected its first woman president!

The new president is Dianne Jackson VK3JDI, a long-time member of GGREC, she has been active in the club in a number of capacities including newsletter editor, and midyear dinner organizer, and for those who attend the highly regarded GGREC hamfest, Dianne, with two sons Hal VK3FTEN and Ross VK3ZAP, would have been seen running the ticket counter. Her OM Ian VK3BUF is GGREC treasurer.

## News from VK4

As mentioned previously many of ALARA's members have other hobbies outside of radio. One such

example is Margaret VK4AOE who enjoys nothing better than crafting with wool and thread. She recently entered some of her work into the Dalby Show. Margaret outlines her interest in her own words.

"My favourite spare time occupation is turning balls of threads into all sorts

of articles such as small and large doilies, tablecloths or runners of all sizes. And of course I love to show them off! Every year I enter several pieces of crochet and knitting in the local show, and this year I did exceptionally well and earned the Most Points Award, also Champion piece of knitting. I never expected so many prizes and I believe the reason this time is that because of the extent of the December/January floods which did cause so much havoc for many people, some exhibitors may not have had time to prepare as much as they normally do. As for me and the flood, I never got flooded out, but *flooded in* with water surrounding our house and surrounds for several days, not once but twice, a week or so apart. Not much else to do except needlework while watching the water rushing by..... Not all of the materials I use are new out of the shop. I made a bed throw out of recycled wool using a pattern for a doily. Then there is the occasional

doily I make  
using 3 strands of  
different coloured  
sewing threads.

Crocheting in particular is something I have done since I was 10 when my poor long suffering mother taught me the basics. Mum was right-handed and I am a lefty! Funny thing is I knit right-handed!"

## VK5 news - Christine VK5CTY

Shirley VK5YL won the DX section of the CLARA 2011 Contest. She has worked for years to make contacts in this contest in particular, so we are very thrilled for her that she has achieved it and done so well.

Shirley herself comments "I had lots of fun during the CLARA Contest during March this year, especially as it included EchoLink contacts. I first made contact with my CLARA sponsor (Audrey VE1PK) way back in 2003/4 after trying for a few months on HF with Audrey and then with Minnie VE3DBQ. I finally made contact with Audrey, and then Minnie the following week. We were all so excited to make the QSO so Audrey, who was moving to an apartment soon (without antennae) suggested we try to make contact via EchoLink. She guided me to the web page and answered my numerous questions and now we have an EchoLink sked every two weeks. We catch up with YLs from all over Canada, sometimes the US and the UK. I am in awe of some of the Canadian YLs who are so adept on their radios (connecting via IRLP) as three of them are white cane operators. I hope that I will be as proficient as these ladies in my 'old age'"



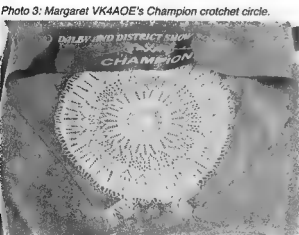
Photo 4: First placed DX YL in the CLARA contest was Shirley VK5YL.

## Dayton Ham Radio Meet

ALARA President Tina VK5TMC and her OM Robert travelled to the U.S.A. and included a visit to the Dayton Ham Radio Meet. She sent a brief message to ALARA members.

"Hi All,

We had a great time at Dayton Ham Radio get together. The weather at Dayton was a little warm but we were lucky with rain.



*Photo 3: Margaret VK4AOE's Champion crotchet circle*



Photo 5: YLs at Dayton. Tina VK5TMC on the right.

It stopped Thursday afternoon and didn't start again until late Sunday night. Dayton was not threatened by tornadoes. We are heading east away from the major tornado threat. We are expecting some rain for all of the next week.

We will get to Washington DC tonight and are enjoying the green country side although we feel for the farmers who have soggy fields and can't plant their crops. Tina & Robert.

### Successful 2011 Annual Conference in Darwin

There were 108 people registered for the 2011 WIA Annual Conference held in Darwin which was held on 27th- 29th May 2011.

### ALARA members in Darwin - Christine VK5CTY

The WIA AGM was very successful. The weather was perfect, and much appreciated by the Southerners who have been having maximum temperatures like the minimums over this weekend. (The locals complained that they had to wear thick dressing gowns and Ugg boots in the mornings - everything is relative, isn't it?)

The Darwin Club had steered the activities and provided food for barbecues etc. and generally made the delegates feel very welcome.

We saw two sunsets over Fannie

Bay and quite a number of waterfalls, all of which were running well after a very wet Wet season (over 3 metres of rain!)

There were nine ALARA members in Darwin but we have only eight of them in the photo

as Lesley VK5LOL and OM Hans VK5YX felt they had neglected their pooch Barney enough the day before so they didn't go out to Litchfield National Park where this photo was taken. (There were a number of places where dogs were only welcome if on a lead, and not always then. I suspect they have had trouble over the years).

On the tour to Litchfield as well as the waterfalls (yes some people swam in them) we saw some of the amazing ant hills. From what we were told they supply a most important food source at the beginning of the wet season when as soon as the first rains fall they fly out of the hills in their millions

In the ALARA photo we have

Megan VK2GGL, Jeanne VK5JQ, Christine VK5CTY, Dianne VK3FDIZ (who was the WIA official photographer for the weekend, too), Jenny VK3MDR who rejoined ALARA this year after about 10 years away, and Joy XYL of David VK5KC in the

back row and seated we have Jenny VK5FJAY and a YL I am ashamed to say I did not get a name or call sign for (my apologies to her).

The motel where most of us stayed looked after us well and provided us with a conference room and a pool (that we did not get time to swim in!!)

On the Saturday the ladies and partners were taken on a very interesting tour of Darwin and surrounds with only one disappointment - the place where pearls are cleaned and cared for was not open. They were interested to see a number of gift stalls at a market that afternoon that were also in the Mindil Sunset Markets where we had the last night of the conference. If we did not buy any gifts, it was only because we were feeling very strong!!

The bus guides for the Saturday afternoon and for the Sunday trip to Litchfield were very good and full of all sorts of stories about the places we were passing. Altogether those of us who went to Darwin had a great time and assured each other we will be seeing each other next year for the last weekend in May, in Mildura.

Photo 6: The ALARA members at the WIA Annual Conference.



Plan NOW for  
**JOTA/JOTI 2011!**

Contact your local  
**Scout or Guide group.**

# 2011 Remembrance Day Contest

Peter Harding VK4OD  
vk4od@wia.org.au

0800 UTC Saturday 13 August to 0759 UTC Sunday 14 August

## Purpose:

This contest commemorates the amateurs who died during World War II and is designed to encourage friendly participation and help improve the operating skills of participants. It is held close to 15 August, the date on which hostilities ceased in the southwest Pacific area.

The contest is preceded by a short opening address by a **Guest Speaker** transmitted on various WIA frequencies during the 15 minutes prior to the contest commencement. During this ceremony, a roll call of amateurs who paid the supreme sacrifice during WWII is read.

A perpetual trophy is awarded annually to the Australian state or territory with the best performance. The name of the winning State or Territory is inscribed on the trophy, and that State or Territory then holds the trophy for 12 months. The winning State or Territory is also given a certificate, as are leading entrants.

## Objective:

Amateurs in each VK call area will endeavour to contact amateurs in other VK call areas, ZL and P29 on all bands except WARC bands. On 1.8, 28, and 50 MHz and above, entrants may also contact other amateurs in their own call area.

## Contest Period:

0800 UTC Saturday 13 August 2011 to 0759 UTC Sunday 14 August 2011.

As a mark of respect, stations are asked to observe 15 minutes' silence prior to the start of the contest, during which the opening ceremony will be broadcast.

## Rules

### 1. Sections:

- High Frequency for operation on bands below 50 MHz;
- Very High Frequency for operation on and above 50 MHz;

Operators may enter each section, but separate logs must be submitted for each section and for each callsign used on that section by the operator

### 2. Categories:

- Single Operator;
  - Multi-operator.
- Note: In the (Multi-operator Category, "many clubs work under this banner", All stations are permitted to enter in "ONE and ONE ONLY" of the following subsections.

### 3. Sub Sections:

- Transmitting Phone (FM, SSB);
- Transmitting CW (CW); Note: CW in this context means CW only; any other digital modes such as Packet, RTTY, AMTOR, PSK31, etc are specifically excluded from the contest.
- Transmitting Open (a) and (b);
- Receiving (a), (b) or (c).

### 3.1: WW2 Ex Military Transceivers and Receivers.

The use of these types of equipment is subject to the following conditions:

- To qualify we require a Photo (as most Hams have access to a digital camera) of the equipment they propose to use, and it MUST be equipment as used in WW2, and not post WW2 manufactured equipment.
- A declaration with the heading of WW2 Equipment will operate said units within the "ORIGINAL manufactures specified operating conditions", e.g. no mods to boost the output power etc. A copy of the preferred Certificate is available on the on the WIA website at:

<http://www.wia.org.au/members/contests/rcontest/documents/WW2%20declaration.pdf>

- As part of Para b above, the declaration will ask for
  - Make (if known)
  - Power output available
  - Type of antenna to be used, it should be of those types available in WW2 period.
  - Anticipated modes AM or CW or FM, (as SSB was not available until the fifties)
  - Frequencies they will use (I look for your guidance here)

- Scoring will be the same as in Para 13 of these rules
- A Certificate with an addition of an area showing the WW2 Category named within.
- All amateurs licensed in Australia, and not physically within VK/P29/ZL, as VKs outside VK may enter the contest, whether their stations are fixed, portable or mobile. See Rule 16.
- Cross-band and/or cross-mode contacts are **not** permitted.
- Operation via any means other than those which use direct radio transmissions is banned. This includes all means such as IRLP or EchoLink, which rely on contact via the internet.
- Contacts via satellites are also not allowed for scoring purposes.
- Call "CQ RD", "CQ CONTEST" or "CQ TEST".
- On ALL bands, stations may be contacted at intervals of not less than two hours since the previous contact on that band and mode.
- No points will be awarded for contacts between stations in the same call area on HF, except on the 160 metre and the 10 metre bands, on which entrants may work stations in the same call area.
- On the 10 metre band, contacts may also be made using the FM mode, using simplex only, on frequencies above 29.0 MHz only. This will be considered a different mode for scoring purposes, so an SSB or CW contact could immediately be made with the same station below 29.0 MHz for an additional score.
- On 50 MHz and above, the same station in any call area may be worked using any of the modes listed at intervals of not less than two hours since the previous contact on that band and mode.
- For the VHF category, up to **three** contacts may be made with the same station consecutively on each band, but must be made using the different



allowable modes of CW, SSB and FM. However, the different modes must be within the frequency ranges stated in the text descriptions of the latest Call Book as 'modes' only. For example, on the two metre band, RD Contest CW contacts may only be made in the range 144.100 to 144.400 MHz. SSB contacts are restricted to 144.100 to 144.400, while FM contacts must be above 146.000 MHz. The national simplex calling channels (146.500 MHz on the two metre band), and the frequencies either side thereof, excluding recognised repeater frequencies, are the **suggested** frequencies. When changing modes, entrants must also change frequency.

18a. Both single and multi-operator entries are permitted. To be eligible as a single operator, one person must perform all operating and logging activities without assistance other than computer logging, using his or her own callsign. More than one person can use the same station and remain a single operator providing that each uses his or her own callsign, submits a separate log under that callsign and does not receive operating or logging assistance in any way other than computer logging during the contest.

9b. Holders of more than one licence or callsign **MUST** submit a separate entry for each callsign used.

10a. Multi-operator stations are only allowed one transmitter per band/mode at any one time. Simultaneous transmissions on different bands are permitted. Simultaneous transmissions on the same band but using different modes are permitted. Any large multi-operator stations may find it more convenient to use separate band and/or mode logs.

10b. Automated operation is not permitted. The operator must have physical control of the station for each contact. However CW and voice keyers are permitted, although the use of computers is **restricted** to logging purposes only.

11a. For a contact to be valid, a three-digit serial number commencing at 001 and incrementing by one for each successive contact must be exchanged between stations making the contact. (RS/RST reporting is not required, but if given should be an accurate appraisal of the signal).

11b Separate logs are required for

entrants competing in both HF and VHF sections, although all allowable modes can be contained within each log.

12. Contacts via repeater, satellite or relay are not permitted for scoring purposes. Contacts may be arranged through a repeater, although contact numbers may not be aired there. Operation on repeater frequencies in simplex is not permitted.

13. Score:

- on 160 metres, two points per completed valid contact;
- on 23cm or higher bands, two points per completed valid contact;
- on all other bands one point;
- on CW irrespective of band, double points.
- all scores obtained between the entrant's local time hours of 0100 and 0600 are doubled. If working into an area where the time is outside those hours, the score is doubled only for the station whose local time is 0100 to 0600 hours.

14. Logs should be in the format shown below and accompanied by a Summary Sheet showing callsign; name; address; category; subsections; for multi-operator stations a list of the operators; total score; declaration: I hereby certify that I have operated in accordance with the rules and spirit of the contest; signed (postal mail only); date. **Please supply a contact telephone number if possible.**

15. Entrants operating on both HF and VHF are required to submit separate logs and summary sheets for both categories. Separate serial numbers for HF and VHF operation.

- **Logs must be serial numbered sequentially on any band within and below,**
- **High Frequency for operation on bands below 50 MHz,**
- **Logs must be serial numbered sequentially on any band within and above,**
- **Very High Frequency for operation on and above 50 MHz;**

16. VK entrants temporarily operating outside their allocated call area, including those outside continental Australia as defined for DXCC, can elect to have their points credited to their home state by making a statement to that effect on their summary sheet(s).

17a. Logs can be submitted by electronic

mail or postal mail. By mail, send logs and summary sheets to: RD Contest Manager Endorse the front of the envelope "Remembrance Day Contest".

Peter Harding VK4OD, 40 Centaurus Cres, Regents Park, QLD 4118.

E-mail, PLAIN TEXT logs only may be sent to [rdlogs@wia.org.au](mailto:rdlogs@wia.org.au)

17b. Electron c Logging is preferred but by no means mandatory. Those entrants with a suitable PC may wish to consider it for this year's contest. By using one of these programs, the file that is emailed to me can be imported easily into the scoring database program. Links for these programs are listed below. I have tried and tested them all and with the assistance of all the creators, they have rewritten parts of their program to assist scoring. On completion of the contest you can email the **VK?XXXX.csv**, which is a comma-delimited file format which can be imported into our database.

See Software download links note below

17c. In all cases, logs must be received by last mail on **Friday 16<sup>th</sup> September, 2011** **Late entries will not be eligible. Electronically sent logs will be returned with a courtesy note, also Snail Mail will be returned unopened.**

17d. If you are sending your logs by electronic means, I would recommend that you set the flag to request "confirmation of receipt" and "when the file is read". This way you will receive two confirmation messages. If you do not receive either return message please **send me an Inquiry mail**. For users of Snail Mail send a self-addressed envelope with the sample reply form to request a receipt for your paper log, which is available at <http://www.wia.org.au/contests/rd/Reply%20Form.pdf> **HOWEVER in all circumstances, the rule as in 17c above WILL STILL APPLY. So get the logs in early.**

18. Certificates will be awarded to the leading entrants in each **sub-section**, both single and multi-operator; in each State; P2 and ZL. Entrants must make at least 10 contacts to be eligible for awards, unless otherwise ruled by the Contest Manager

19. Any station observed as departing from the generally accepted codes of operating ethics may be disqualified.

## Determination of Winning State or Territory

Scoring will be achieved by taking the total number of logs for each State or Territory, divided by the total number of licences issued in that State or Territory (excluding beacons and repeaters) as published in the WIA Callbook for that year, and multiplying by the total score for that State or Territory. Points can only be considered where a station has submitted a valid log.

Unless otherwise elected by the entrant concerned, the scores of VK0 stations will be credited to VK7, and the scores of VK9 to the mainland call area which is geographically closest. Scores of P2, ZL and SWL stations will not be included in these calculations, although entrants in those areas are eligible for all certificate awards.

## Receiving Section Rules

- This section is open to all SWLs in Australia, Papua New Guinea and New Zealand. **Licensed operators may enter this section but this will make them ineligible to also compete in the Transmitting sections.**
- Rules are the same as for the Transmitting Section. The only double points will apply to **ALL received** CW contacts, and contacts **received** between D100 K and 0600 K.
- Only completed contacts may be logged, it is not permissible to log a station calling CQ.

## Layout of logs:

The log should be in the format shown below, whether submitted electronically or via the postal mail. Sample logs are available on the WIA and local website or may be posted on request, with a **stamped, self-addressed envelope**.

## Sample Summary Sheet:

Remembrance Day Contest 2011

Call sign: VK1xxx

Name: Operator's full name

Address: Physical address of contest station

Category: Single or Multiple Operator

Section: HF or VHF

Sub Section: Transmitting Phone, CW or Open (both)

Total Score: number of points claimed

Declaration:

I hereby certify that I have operated in accordance with the rules and spirit of the Contest.

**Note:** Some software may require you to click on a button as your affirmation of operation according to the rules for this contest.

**Signed:** Your signature if log is submitted via mail.

**Date:** date submitted

## Sample Transmitting Log

Remembrance Day Contest 2011

Call sign: VK1xxx

Category: HF or VHF / Single or Multiple Operator

Section: Transmitting Phone, CW or Open

## Sample Receiving Log Name/SWL Nr:

Category: HF

Time (UTC)	Band (MHz)	Mode	Call	Number Sent	Number Rcvd	Pts
0801	14	CW	VK2QQ	001	002	2
0802	14	SSB	VK6LL	002	001	1
0806	14	SSB	VK5ANW	001	003	1
0808	14	SSB	ZL2AGQ	004	004	1

Section:

Receiving Phone:

## Links to Computerised Logging Programs

NOTE: Please check your favourite website for current versions, as most of the

Time (UTC)	Band (MHz)	Mode	Call 1st Op	Call 2nd Op	Number 1st Op	Number 2nd Op	Pts
0801	14	SSB	VK1XXX	VK2QQ	001	002	1
0802	14	SSB	VK1XXX	VK6LL	002	001	1
0806	14	SSB	VK5ANW	VK1XXX	001	003	1
0808	14	SSB	VK7AL	VK2PS	007	010	1

programmers are now doing a rewrite, to allow for this year's rule changes.

From Mike Subocz VK3AVV, the VK Contest Log (VKCL) can be found at the following URL:

<http://web.sanet.com.au/mnnd/>

From John Drew VK5DJ RD logging program can be found at the following URL:

[http://vk5dj.mountgambier.org/Amateur\\_radio.html](http://vk5dj.mountgambier.org/Amateur_radio.html)

From James McBride VK6FJA WinRD+ logging program can be found at the following URL:

<http://www.rjmb.net/rd/index.htm>

From Paul O'Kane from Ireland, his SD logging program can be found at the following URL:

<http://www.ei5di.com/>

As shown below is a chart for the structure for this year's RD Contest. Logs can either show the numeric value or the Text for the type of operation that you are participating in.

If you are unsure what they mean please send me a message and I will explain further it can sent to [rdlogs@wia.org.au](mailto:rdlogs@wia.org.au)

A	111	VHF, Single, Phone
	112	VHF, Single, CW
	113	VHF, Single, Open
	114	VHF, Single, RX Only
B	121	VHF, Multi Op, Phone
	122	VHF, Multi Op, CW
	123	VHF, Multi Op, Open
	124	VHF, Multi Op, RX Only
C	211	HF, Single OP, Phone
	212	HF, Single OP, CW
	213	HF, Single OP, OPEN
	214	HF, Single OP, RX
D	221	HF, Multi OP, Phone
	222	HF, Multi OP, CW
	223	HF, Multi OP, Open
	224	HF, Multi OP, Rx

# AMSAT

David Giles VK5DG  
vk5dg@amsat.org

## Two more sick satellites

News of AO-51 and HO-68's condition has come to light. AO-51 is suffering from a faulty battery cell and is unable to hold enough power to keep the on-board computer alive during an eclipse. Currently one of the repeaters is on but only when commanded by a ground station. We may be fortunate for the repeater to still be on during a morning pass.

HO-68 has been stuck in beacon mode for most of the year. CEO of Camsat Alan Kung BA1DU gave a talk at the Dayton Hamvention. He said that either a relay or its driver circuit that switches between beacon and transponder modes is failing. They have not given up trying but it is unlikely that they will be able to restore the transponder. Apart from that HO-68 is in good health.

## Six-monthly review of operational OSCARS

Here is an updated review of the operational OSCARS and other satellites using amateur satellite service bands. All satellites listed here have been heard by myself during May 2011 except NO-44, AO-51, SO-67 and O/OREOS. No satellites have been added but most have been revised since the last review in January. The only failed satellite since last review is RAX-1. Its mission has ended due to low solar panel output.

The names of the satellites are given as OSCAR number, full name and (NASA catalogue number). Modes are represented by frequency bands: H=10m, V=2m, U=70cm, L=23cm, S=13cm in order of uplink/downlink.

Linear transponders use CW and SSB. With the exception of AO-7's V/H transponder, all linear transponders are 'inverting' types and use LSB for the uplink and USB on the downlink. For AO-7 mode V/H use USB for both links. Most of the activity is in the middle of the passband.

Foundation licensees are permitted to transmit SSB/CW and FM voice to any of the satellites in the 10m, 2m and 70cm bands as well as receive all the satellites. Foundation licensees are not permitted to use 23cm uplinks (e.g. AO-51 and CO-87) or AO-51's 13cm downlink (e.g. mode V/S). See the AMSAT column in September 2009 AR for more details.



### AMSAT-VK

#### AMSAT Co-ordinator

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#### Group Moderator

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#### Website

[www.amsat-vk.org](http://www.amsat-vk.org)

#### Group site:

[group.amsat-vk.org](http://group.amsat-vk.org)

### About AMSAT-VK

AMSAT VK is a group of Australian amateur radio operators who share a common interest in building, launching and communicating with each other through non-commercial Amateur Radio satellites. Many of our members also have an interest in other space based communications, including listening to and communicating with the International Space Station,

Earth-Moon-Earth (EME), monitoring weather (WX) satellites and other spacecraft. AMSAT-VK is the primary point of contact for those interested in becoming involved in amateur radio satellite operations. If you are interested in learning more about satellite operations or just wish to become a member of AMSAT-Australia, please see our website.

### AMSAT-VK monthly net Australian National Satellite net

The net takes place on the second Tuesday of each month at 8.30 pm eastern time, that is 0930 Z or 1030 Z depending on daylight saving. The AMSAT-VK net has been running for many years with the aim of allowing amateur radio operators who are operating or have an interest in working in the satellite mode, to make contact with others in order to share their experiences and to catch up on pertinent news. The format also facilitates other aspects like making 'skeds' and for a general 'off-bird' chat. In addition to the EchoLink conference, the net will also be available via RF on the following repeaters and links.

#### In New South Wales

VK2RMP Maddens Plains repeater 146.850 MHz

Link

VK2RIS Saddleback repeater 146.975 MHz

VK2RBT Mt Boyne Repeater on 146.675 MHz

#### In Queensland

VK4RIL Laidley repeater on 147.700 MHz

VK4RRR Redcliffe 146.925 MHz IRLP node 6404, EchoLink node 44666

#### In South Australia

VK5TRM, Loxton on 147.125 MHz

VK5RSC, Mt Terrible on 439.825 MHz IRLP node 8278, EchoLink node 399996

#### In Tasmania

VK7RTV Gawler 6 m. Repeater 53.775 MHz

IRLP node 6124

VK7RTV Gawler 2 m. Repeater 146.775 MHz

IRLP node 8616

#### In the Northern Territory

VK8MA Katherine 146.700 MHz FM

Operators may join the net via the above repeaters or by connecting to EchoLink on either the AMSAT-NA or VK3JED conference. The net is also available via IRLP reflector number 9558. We are keen to have the net carried by other EchoLink or IRLP enabled repeaters and links in order to improve coverage. If you are interested in carrying our net on your system, please contact Paul via email. Frequencies and modes can change without much notice. Details are put on the AMSAT-VK group site.

### Become involved

Amateur satellite operating is one of the most interesting and rewarding modes in our hobby. The birds are relatively easy to access and require very little hardware investment to get started. You can gain access to the FM 'repeaters in the sky' with just a dual band handheld operating on 2m and 70cm. These easy-to-use and popular FM satellites will give hams national communications and handheld access into New Zealand at various times through the day and night. Should you wish to join AMSAT-VK, details are available on the web site or sign up at our group site as above. Membership is free and you will be made very welcome.

Telemetry decoding programs for several satellites are available from Mike Rupprecht's website at <http://www.dk3wn.info/software.shtml>

### AO-7 AMSAT OSCAR 7 (7530)

**Launched:** 15/11/1974

**Status:** Operational only when it is in sunlight. It may be in any mode. During non-eclipse periods it will alternate between modes V/H and U/V every 24 hours. Beacons are not always on.

**Mode:** V/H (old mode 'A'), linear, non-inverting

**Uplink:** 145 850-145 950 MHz, Downlink: 29.400-29.500 MHz

**Beacon:** 29.502 MHz CW. Occasionally the 435.106 MHz CW or RTTY beacon may be on.

**Mode:** U/V (old mode 'B'), linear, inverting.

**Uplink:** 432.125-432.175 MHz, Downlink: 145 975-145 925 MHz

**Beacon:** 145 972 MHz CW at 10 or 20 wpm, intermittent operation.

Check the online log for current status at <http://www.planetemily.com/ao7/main.php>

### UO-11 UOSAT-2 (14781)

**Launched:** 1/3/1984

**Status:** Intermittent. UO-11's 145.826 MHz beacon came back to life late 2009 after being silent for 18 months and will only work when in full sunlight. You may hear its distinctive signal while monitoring the frequency for other satellites such as ISS, NO-44 and FO-70.

**Beacon:** 145.826 MHz FM 1k2 AFSK

<http://www.g3cww.co.uk/oscar11.htm>

### IO-26 ITAMSAT (22826)

**Launched:** 26/09/1993

**Status:** Semi-operational. IO-26 is in Master Boot Loader (MBL) mode. It transmits continuous BPSK carrier with the occasional telemetry packet.

**Beacon:** 435.790 MHz 1k2 BPSK (Note: this has shifted from the original published frequency)

<http://www.amsat.dk/oz7sat/tlm/view.php?sat=io26>

### FO-29 FUJI-OSCAR 29 JAS-2 (24278)

**Launched:** 17/8/1996

**Status:** Semi-operational as linear transponder. Most activity is around 435.850 MHz. The BBS and dig peater operation have not been used since 2003. It should not be experiencing eclipse problems until 2012.

**Mode:** V/U linear, inverting.

**Uplink:** 145.900-146.000 MHz, Downlink: 435 900-435.800 MHz

**Beacon:** 435 795 MHz CW telemetry. <http://www.ne.jp/asahi/hamradio/je9peli/index.htm>

### GO-32 Gurwin TechSat-1B (25397)

**Launched:** 10/11/1992

**Status:** Intermittent. Since 30/3/2009's on-board computer crash GO-32 has been sending intermittent telemetry. GO-32 has often been operating in 'emergency mode' with a 1k2 signal on 435.325 MHz.

**Beacon:** 435.225 MHz 9k6 FSK

**Emergency Beacon:** 435.325 MHz 1k2

**Beacon call sign:** 4XTECH-11

<http://www.amsat.org/amsat-new/satellites/>

[satinfo.php?satID=14&retURL=/satellites/status.php](mailto:satinfo.php?satID=14&retURL=/satellites/status.php)

### NO-44 PCSAT (26931)

**Launched:** 30/03/2001

**Status:** Operational only in full sunlight.

One solar panel and the batteries are not functioning.

**Mode:** V/V 1k2 AFSK packet digipeater

**Uplink:** 145.827 MHz, Downlink: 145.827 MHz

<http://pcsat.aprs.org>

### SO-50 SAUDISAT-1C (27607)

**Launched:** 20/12/2002

**Status:** Operational. SO-50 has a sensitive receiver and a transmit power of only 250mW.

**Mode:** V/U FM voice with 67 Hz CTCSS tone

**Uplink:** 145.850 MHz, Downlink 436.795 MHz (but may switch to 436.800MHz).

To switch the transmitter on you need to send a few seconds of 74.4 Hz CTCSS tone.

The order of operation is thus (allow for Doppler as necessary):

- 1) Transmit on 145.850 MHz with a tone of 74.4 Hz to arm the 10 minute timer on board the spacecraft.
- 2) Now transmit on 145.850 MHz FM voice using a 67 Hz CTCSS tone to access the transponder.
- 3) Sending the 74.4 Hz tone again within the 10 minute window will reset the timer. Users have reported difficulties.

### AO-51 AMSAT-OSCAR-51 ECHO (28375)

**Launched:** 29/6/2004

**Status:** Semi-operational

**Mode:** V/U FM voice.

As noted above AO-51 has battery problems and is going through a long period of eclipses.

Please check the website for the latest news. Either 70 cm downlink may be in operation.

**Uplink:** 145.920 MHz, Downlink 435.300

MHz (67 Hz PL tone may be required) FM voice

**Beacon:** 435.150 MHz 9k6 FSK

<http://www.amsat.org/amsat-new/echo/C7News.php>

### VO-52 HAMSAT (28650)

**Launched:** 5/5/2006

**Status:** Operational. VO-52 has two linear transponders that use nearly the same passbands. The Indian transponder is normally on. Most activity is around 145.900 MHz.

**Mode:** U/V linear inverting

**Indian transponder:**

**Uplink:** 435 220-435 280 MHz, Downlink: 145.930-145 870 MHz

**Beacon:** 145 936 MHz continuous carrier

**Dutch transponder:**

**Uplink:** 435.225-435 275 MHz, Downlink: 145.925-145.875 MHz

**Beacon:** 145 860 MHz CW 12 WPM preset message

<http://www.amsatindia.org>

Note: FM operation on VO-52 is permitted for QRP/handheld. In India, SSB gear is not very common and the operations team have suggested that FM operators can use this bird. If you are planning to work FM, please use another part of the passband e.g. 145.920 MHz. It would be best to arrange a sked in advance, as VO-52 is rarely used in FM mode over VK/ZL. Excessive uplink power will cause the beacon to FM. The following are mainly Cubesats.

Reception reports are often well received and can result in a QSL card for your efforts. See websites for details.

### CO-55 CUTE-1 (27844)

**Launched:** 30/6/2003

**Status:** Operational. From the first cubesat launch CO-55 continues to send CW telemetry though the beacon now has an additional: weak carrier.

**Beacon:** 436.8375 MHz CW telemetry

[http://iss.mes.titech.ac.jp/ssp/cubesat/index\\_e.html](http://iss.mes.titech.ac.jp/ssp/cubesat/index_e.html)

### CO-57 XI-IV (27848)

**Launched:** 30/6/2003

**Status:** Operational. From the first cubesat launch, CO-57 continues to send CW telemetry. It also has an on-board camera. Pictures of the Earth can be found on the website below.

**Beacon:** 436.8475 MHz CW telemetry

<http://www.space.t.u-tokyo.ac.jp/gs/en/index.aspx>

### CO-58 XI-V (28895)

**Launched:** 27/10/2005

**Status:** Operational. CO-58 has an on-board camera. Pictures of the Earth can be found on the website below.

**Beacon:** 437.465 MHz CW telemetry

<http://www.space.t.u-tokyo.ac.jp/gs/en/index.aspx>

### DO-64 Deifi-C3 (32789)

**Launched:** 28/4/2008

**Status:** Semi-operational. The linear transponder has failed. The control team switched DO-64 back to science mode on 29/1/2009. Often by the time it has reached VK/ZL the transmitter has stopped, so it will be heard here occasionally. If they change it to basic mode then the telemetry will be heard over VK/ZL on most passes. The telemetry can be demodulated and decoded using software from the Deifi website.

**Beacon:** 145.870 MHz (primary) or 145.930 MHz (secondary) 1k2 BPSK telemetry  
<http://www.delfic3.nl/index.php>

### CO-65 CUTE-1.7+APDII (32785)

**Launched:** 28/4/2008

**Status:** Operational. The CW beacon is on continuously. The mode L/U APRS digipeater has been activated during weekends using 9k6 GMSK modulation. Unprolto via JQ1YTC.

**Mode:** L/U 9k6 GMSK

**Uplink:** 1267.602 MHz, Downlink 437.475 MHz

**Beacon:** 437.275 MHz CW telemetry.  
[http://lss.mes.btech.ac.jp/ssp/cute1.7/index\\_e.html](http://lss.mes.btech.ac.jp/ssp/cute1.7/index_e.html)

### CO-66 SEEDS II (32791)

**Launched:** 28/4/2008

**Status:** Operational. CO-66 is a cubesat that transmits CW telemetry, packet telemetry and a pre-recorded message of voice and SSTV. Sometimes all three can be heard during a pass over VK/ZL as it changes modes. At 450 mW output, CO-66 has the strongest signal of the cubesats.

**Beacon:** 437.385 MHz CW telemetry, 1k2 AFSK packet and FM DigitaTalker/SSTV  
[http://cubesat.aero.cst.nihon-u.ac.jp/english/main\\_e.html](http://cubesat.aero.cst.nihon-u.ac.jp/english/main_e.html)

### SO-67 SumbandilaSat (35870)

**Launched:** 17/9/2009

**Status:** Operational but transponder times are set by command stations. SO-67 will not be available for every pass. Its high powered transmitter (5 watts) is easily heard. There is a 3 second tail after each transmission, so pause before transmitting to the satellite. Keep your overs brief as there is also a cut-out timer. For best results set your radio to narrow FM or turn down the mic gain if your transmitter allows. SO-67 is scheduled for use over a different area each week. For VK/ZL it is usually during the last week of the month. For the current schedule see the AMSAT-SA website at <http://www.amsat-sa.org.za/>

**Mode:** V/U FM voice

**Uplink:** 145.875 MHz with 233.6Hz CTCSS,  
**Downlink:** 435.345 MHz  
<http://sumbandilamission.blogspot.com>

### HO-68 XW-1 CAMSAT (36122)

**Launched:** 15/12/2009

**Status:** Semi-operational. As mentioned above a relay is stopping use of the transponders but the beacon is operating continuously.

**Mode:** V/U FM voice

**Uplink:** 145.825 MHz 67.0Hz CTCSS,  
downlink 435.675 MHz

**Mode:** V/U linear (inverting)

**Uplink:** 145.925 - 145.975 MHz, Downlink:  
435.765 - 435.715 MHz

**Mode:** V/U PacSat BBS

**Uplink:** 145.825 MHz 1k2 AFSK packet,  
**Downlink:** 435.675 MHz 1k2 AFSK packet

**Beacon:** 435.790 MHz CW telemetry  
<http://www.camsat.cn>

### FO-69 FASTRAC 1 (37227)

**Launched:** 20/11/2010

Known as "Sara Lily". FO-69 and FO-70 are a dual system to explore inter-satellite communications.

**Mode:** V/U FM PACKET

**Uplink:** 145.980 MHz 1k2 AFSK, 145.825 MHz 9k6, Downlink: 435.345 MHz

### FO-70 FASTRAC 2 (37380)

**Launched:** 20/11/2010

Known as "Emma".

**Mode:** U/V FM PACKET

**Uplink:** 435.025 MHz 1k2 AFSK, 437.345 MHz 9k6, Downlink: 145.825 MHz

[http://fastrac.ae.utexas.edu/our\\_project/overview.php](http://fastrac.ae.utexas.edu/our_project/overview.php)

## RS-series satellites

### RS-15 RADIO ROSTO (23439)

**Launched:** 26/12/1994

**Status:** Intermittent. The beacon only comes on when satellite is in full sunlight, and is not on every pass.

**Beacon:** 29.352 MHz on/off carrier

### RS-30 YUBILEINY (32953)

**Launched:** 23/5/2008

**Status:** Operational. Only the CW beacon has been heard over VK/ZL. Other transmission types are heard when it is in range of the control stations in Russia. It has been heard by AO-51 users when they share the same footprint.

**Beacon:** 435.315 MHz (primary), 435.215 MHz (secondary) CW telemetry

[http://www.dk3wn.info/sat/afu/sat\\_rs30.shtml](http://www.dk3wn.info/sat/afu/sat_rs30.shtml)

## Other satellites using amateur frequencies.

### ISS (25544)

**Launched:** 20/11/1998

**Status:** Operational. The International Space Station has an amateur radio station that operates in many modes. Ultimately it depends on the manned crew's activities. Voice, digital, and SSTV modes are used. Sometimes experimental modes are tried, one example was a 23 cm FM repeater uplink on 1269.650 MHz.

**Mode:** U/V crossband FM repeater,  
**Uplink:** 437.800 MHz FM, Downlink: 145.800 MHz

**Mode:** V/V Digital / APRS 1k2 AFSK FM  
**Uplink:** 145.825 MHz FM, Downlink: 145.825 MHz

**Mode:** V/V FM Voice, SSTV  
**Uplink:** (Region 1) 145.200 MHz, (Region 2/3) 144.490 MHz, Downlink: 145.800 MHz

<http://www.issclub.com/>

<http://www.rac.ca/ariss/>

# COM-AN-TENA

## Australian made antennas setting a new standard

30/17/12 m Rot-Dipole	\$312
3 elem ea band 1 coax 10-15-20	\$680
Log-periodic 6 elem 6.4 m boom	\$725
20 m 3 elem med duty 100 km/h	\$420
Log-periodic 10-30 8 elem 10 m 1 boom	\$1245
15 m 3 elem 3.6 boom	\$314
Mb vert auto switch 10-80 m	\$360
40 m lin load 2 elem/cap hats	\$670
6 m 5 elem 3.6 m 1 boom	\$314
23 cm 36 elem 2 m 1 boom n-con	\$249
70 cm high gain Yagi 3 m boom	\$170
2 m 10 elem h/gain Yagi	\$190
10/15/20 2 elem each boom 5.5 m1	\$459
40 m 1/4 W vert/free standing	\$270
10/15/20 vertical with radials	\$289
Rotable Dipole 10/15/20 m	\$272

## Guyed masts 13 or 21 metres

Winch up, tilt-over,  
aluminium and stainless steel  
three sided construction.  
Auto brake winches.

115 John Street  
Glenroy VIC 3046

Phone  
**0419 542 437**  
or send SMS

### COMPASS-1 (32787)

Launched: 28/4/2008

**Status:** Operational. Compass-1 has a chirp CW telemetry beacon that is normally sent every 3 minutes. If battery voltage is low it will send every 8 minutes. COMPASS-1 can be commanded by any amateur to send telemetry on demand using DTMF codes, though the satellite may not give a response each time. Every command will give a confirmation beep on 437.275 MHz.

**\*\*35## - request a test beacon CW**

**\*\*36## - request a test packet 1k2 AFSK FM (UI-Frame)**

**\*\*60## - request a housekeeping frame in 1k2 AFSK FM (KISS frame)**

**Mode:** V/U DTMF command, 1k2 AFSK

**Command:** 145.980 MHz, Downlink 437.405 MHz

**Beacon:** 437.250 MHz CW telemetry

<http://www.cubesat.de>

### STARS (33498)

Launched: 23/1/2009

**Status:** Operational. STARS is two satellites tethered together. Both 'Mother' and 'Daughter' have CW and 1k2 AFSK packet telemetry on 70cm. The CW beacon of 'Mother' is on continuously, but 'Daughter's weaker and intermittent.

**Beacon:** Mother 437.485 MHz, Daughter 437.465 MHz FM 1k2 AFSK

**Beacon:** Mother 437.305 MHz, Daughter: 437.273 MHz CW telemetry

<http://stars1.eng.kagawa-u.ac.jp/english/index.html>

### PRISM (33493)

Launched: 23/1/2009

**Status:** Operational. Following from the success of CO-57 and CO-58, the University of Tokyo built PRISM to carry a larger camera with a telephoto lens. The packet downlink is only available over the command stations in Japan, though the CW beacon is on world-wide. PRISM also has an uplink channel but frequency and modulation details have not been published yet. A new website has been made and pictures from PRISM are now available.

**Mode:** -/U 1k2 AFSK or 9k6 GMSK

**Downlink:** 437.425 MHz

**Beacon:** 437.250 MHz CW telemetry

<http://www.space.t.u-tokyo.ac.jp/prism/en/main.html>

### KKS-1 (33499)

Launched: 23/1/2009

**Status:** Operational. KKS-1 transmits a series of messages on its CW beacon.

**Beacon:** 437.385 MHz CW message

<http://www.kokuku-k.ac.jp/~kks-1/kks-gs-top-e.htm>

### SWISSCUBE (35932)

Launched: 23/9/2009

**Status:** Operational. Transmits CW telemetry with frames every 30 seconds. Decoding software is available at their website.

**Beacon:** 437.505 MHz CW telemetry

<http://swisscube.epfl.ch>

### ITUpSAT (35935)

Launched: 23/9/2009

**Status:** Operational. This Turkish cubesat transmits a frame of CW every three minutes giving its name and callsign.

**Beacon:** 437.325 MHz CW message

### Tisat-1 (36799)

Launched: 12/7/2010

**Status:** Operational. Tisat-1 is the first Swiss student-built satellite. Its mission is to test various materials exposed to atomic oxygen at low Earth orbit.

**Downlink:** 145.980 MHz FM FSK, CW

**Beacon:** 437.305 MHz CW at varying speeds.

<http://www.spacelab.dti.supsi.ch/tisat1MS.php>

### O/OREOS (37224)

Launched: 20/11/2010

Organism/Organic Exposure to Orbital Stresses. O/OREOS is the next NASA scientific cubesat experiment after GeneSat and PharmaSat. This experiment monitors the growth of micro-organisms and changes in organic molecules in space. Currently the 70 cm beacon is turned off.

**Beacon:** 437.302 MHz 1k2 AFSK telemetry

<http://oreos.engr.scu.edu/dashboard.htm>

### Final pass

Plenty of bad news this month with AO-51 and HO-68 in trouble. While they have not been declared dead the prognosis isn't good. Also SO-67 has had battery problems of late. AO-7, FO-29, SO-50 and VO-52 are still performing well and new satellites are in the pipeline.



## VK3news

### Eastern Zone Amateur Radio Club

Chris Morley VK3CJ/K



Preparations for GippsTech 2011 are in full swing.

The Proceedings from 2010 are compiled and at the printer. The program is taking shape, and registrations are rolling in.

We will be trying some different options for lunches this year, with a spit roast on Saturday and pizza for Sunday.

Presentations confirmed include:

- Recycling crimp connectors (without need for special tools).
- Sporadic E: MUF myths, SSSP and forecasting openings.

- Chirp beacon and radar developments.
- The chirp backscatter radar: analyses of further HF and VHF propagation experiments and proposals for future use.
- Development of a solar powered remote site.
- 600 m band experimental licences & experiences
- Doppler shift estimation for 10 GHz aircraft enhancement
- Companions of aircraft scatter at 144, 432, 1296 and 10 GHz.
- DX strategies for 10 GHz.
- Rubidium frequency standards.

- Libration.
- Which IF for the microwave bands?
- Propagation measurements using the Tasmanian GPS stabilised beacons.

We are also planning a Partners' program, for those not interested in the technical program.

Full details can be found on the Club website: <http://www.vk3bez.org/>

Register NOW: registration closes on Sunday 3 July. The form is available on the website.



# DX-News & Views

John Bazley VK4OQ  
john.bazley@bigpond.com

Well we do seem to be having a 'bumpy ride' with band conditions, but the gurus are now predicting that conditions will peak in 2013/14 but not to expect too much. We have recently had some very good openings on 10 m but nothing like we have had in previous 'good years'.

The much anticipated 2012 DXpedition team heading to **Malpelo Island** have now added a few well known DXpeditioners to the team. The original DX Colombia Amateur Radio Club (DXARC) team included team leader Jorge HK1R, as well as HK1T and HK1X. Plans were to have eight Colombian operators and four "International" operators. The HK0NA website now lists the international team members, DJ9ZB, YV5SSB and OH0XX. Also added to the list are Colombian operators HK1MW and HK1N. Current plans are to have at least three stations QRV on 1.8 through 50 MHz on CW, SSB and RTTY.

Jorge HK1R has established contact with a ship that makes "frequent authorized" diving expeditions off the coast. The Sea Wolf is capable of accommodating 16 people. "Based on the conversations with them and the 'visits schedule' by the Environmental Authority, which controls the island access, our most probable sailing date will be February 15 2012". The February 2012 Malpelo Island DXpedition team now has a Website at <http://hk0na.wordpress.com/>

The Hellenic Amateur Radio Association of Australia plans a major DXpedition to **Lord Howe Island**, July 8-17. Callsign VK9HR, the operation will be on "multiple bands simultaneously to give everyone the chance to contact Lord Howe Island." Originally scheduled for July 8-17, VK9HR Lord Howe Island has now moved back a bit, to start July 23 and running into

August so that they can participate in the RSGB IOTA Contest. [www.lordhowe2011.com](http://www.lordhowe2011.com)

The team heading to **Jan Mayen Island** in July, initially announced as JX7VPA, are pleased to report they have the privilege to activate the island under the unique, special callsign, JX5O, thanks to assistance and support of the LA5O Ringsjoen Contest Club founded by Rag LA6FJA and Svein LA5FHA. Following Norwegian regulations, the allocation of the callsign has been arranged with the Norwegian Post and Telecom Department by the Club's committee.

Stan SQ8X, the JX5O team leader, and the entire JX5O team wish to thank LA5O Ringsjoen Contest Club for the support provided and we are very thankful for the recognition received among Norwegian hams. The team will take and donate a 6 m vertical for JX7SIX – the six metre beacon on Jan Mayen Island, which went QRT in 2007 after mechanical failure. The antenna will be installed by the next maintenance team going to the island after the DXpedition. More news at: <http://janmayen2011.org/>

**JW/G3SVK** will be a one-day operation on 25 July. He will be in the shack of JW5E while making a port call during a family vacation cruise. Fred will operate mostly CW but will "make an excursion to SSB."

Howard WB4WXE is planning a return to **St. Lucia** from 25 June to 15 July. His call will be J68HS with an emphasis on 50 MHz. "However, when 6 metres is quiet, attention will be given to 12 m, 17 m, 40 m and 160 m", says Howard. He will be operating from a location (grid locator FK93) some 2,000 feet above Soufriere.

Antennas will include a 6 element Yagi on 50 MHz, 2 element Yagi for 18 MHz and a vertical for 1.8, 7 and 24 MHz. Howard will be using an Icom IC-706 with Tokyo Hy-Power

HL-550fx 550 watt 1.8-50 MHz amplifier. He will also be taking a 200 watt 6 metre amp for Tot J69MV, a local six metre operator who is QRV on the Magic Band. QSL J68HS via WB4WXE.

FP/K9OT will be on the air again from **Miquelon Island** (NA-032), as always using the famous Room 5 at Motel Miquelon. Paul K9OT and Peg KB9LIE will be arriving at the St. Pierre airport on 21 July and leaving on 4 August. They will operate CW and sideband with capability for 80-10 metres, however the main bands will be 40, 30, and 17. A few nice openings on 15, 12 and 10 are eagerly anticipated. They also plan to participate in the IOTA Contest on July 30-31. Internet access is usually available for log uploads. QSL via LOTW, buro, or direct to K9OT. Website: <http://www.hamradio.pnpfarms.com/>

Joe Musachia KH4/W5FJG arrived May second on **Midway Island** as the chief communications officer. He plans to be active on 40-6 SSB, CW and digital modes starting, he hopes, the last week of May or June 1. He will add 80 m if he can "get a good vertical to the island." He will live and work on the island at least a year. Antennas will be modest, installed to have minimal impact on the island's bird life.

The rig is an Icom IC-7000, but with no power supply and no antennas yet. Joe would love to have "a multi-band vertical or small HF Yagi" donated and wants a QSL manager. Contact him at [joeyjeepusa@yahoo.com](mailto:joeyjeepusa@yahoo.com). Joe's operating times will be weekends and off-duty times on weekdays. He is setting up a website with info on the island and his operating schedule. He hopes to set up a long-term station on the island, so the island can stay on the air after his tour is over.

Laurent F8BBL plans to be back on Corsica as TK11QRP from 23

July to 6 August. Listen for him on CW on 80 through 10 metres running QRP with an FT-817ND and an MP1 vertical. QSL via F8BBL.

Yuri N3QQ and other Russian Robinson Club members plan to operate as KL7RRC from **St. Matthew Island** (NA-232, new one) and catively between 29 July and 5 August. "Our plans depend on weather, final permission from the US Fish and Wildlife Service and transportation availability". QSL via UA9OBA and N7RO. Check <http://www.na-234.com/> for updates.

Bill V31BG is on from **Belize** until October 12. QSL to his home call, VE7ISV in British Columbia, Canada.

**VP8ORK**: Don N1DG says the cards have just arrived from the printer. Expect to see these cards by the end of the month for those who submitted via the OQRS.

Vlad RA9LR, ex-S79LR and 8Q7LR, will be on **Langkawi Island**, West Malaysia, as 9M2/RA9LR, mid-May to mid-July. He plans to be on CW, PSK, RTTY and SSB, then travel

on to the **Maldiv Islands**. His total time off work is 21 June to 2 July. QSL to the QRZ.com address, via UA9LP direct or bureau.

Chris ZS6EZ is now active as **9J2RI** and expects to be active from there for up to two years. His operation will be on all HF bands using CW/SSB/Digital. He has a stateside QSL Manager. QSL to: 9J2RI, Box 333, Bethlehem, GA 30620 USA with SASE or SAE and return postage. Please do not send EXPIRED IRCs. Bureau route is OK, but do not expect fast turn-around.

Five German operators will activate **Ascension Island**, ZD8D, 24 July to 9 August. They plan to be on 160-6 m and be in the IOTA Contest the last weekend of July. They will focus on digital modes and CW but will also operate on SSB. Team members are DK1IP, DL7OR, DJ4KW, DL1CW and DJ9KH as team leader. They will have two stations on the air with Yagis, quads and verticals. They are still looking for a sponsor for amplifiers; their rigs will

be Elecraft K3s, 100 watts. A web page is under construction.

Finally world traveller Vladimir Bykov UA4WHX is currently (end of May) in **Egypt** and began activity as SU9VB. So far he has been reported QRV on 17 metres CW and SSB. No word yet on how long he will be there or if this is the beginning of another long trip round Africa. However we do know he will not be QRV on 80 or 30 metres as these bands are reserved for emergency communications only and there will be no 6 metre activity as 50 MHz is apparently not allowed. QSL via UA4WHX with IRC or his first choice PayPal. He requests that you not send cash.

Good luck in the pile-ups!

Special thanks to the authors of **The Daily DX (W3UR)**, **425 DX News (1JQJ)** and **QRZ.DX** for information appearing in this month's DX News & Views. For interested readers you can obtain from W3UR a free two-week trial of The Daily DX from [www.dailydx.com/trial.htm](http://www.dailydx.com/trial.htm)



## Silent Key Terry Tongs formerly VK7TT

Born in 1925, Terry spent his younger years at Preston just inland from Ulverstone. In those days it was connected with Ulverstone by rail. There, on the farm, he discovered the wonder of radio by building and experimenting with crystal sets

After attending Devonport High School, Terry joined the No. 7 Elementary Flight Training school at Evandale where his training included Morse code, before joining the RAAF. There, in the communications section, he worked in the message deciphering area and was later posted to Dutch New Guinea, where he started a draftsmanship course by correspondence. On his return home, he secured a job with the Public Works Department in Burnie.

In the 1960s Terry, an active

member of the North West Branch of The Wireless Institute of Australia, studied and gained his full call amateur licence. His knowledge of war time radios led him to acquire an army disposals 122 set and he became a familiar voice on the HF bands, particularly on 80 metres in the evenings. He took pride in improving the set's power output, and experimenting with various ways of obtaining deep amplitude modulation.

He was an expert in transmitter hunting, often taking the family along on club outings. Terry was always willing to operate the club station in the RD contest, and as a Scout Leader, he encouraged scouts to become interested in the hobby on the various jamborees he attended.

After retiring in 1982, Terry moved several times, firstly to Upper Natone,

later to Scottsdale. On returning to a unit in Ulverstone, Terry parted with most of his gear and let his call-sign lapse. Terry was very fond of collecting useful items at "Mitre 11" - his wife's name for the local tip! After taking a trailer load of rubbish to dispose of, he would return with just as much or more stuff. On one occasion he had to hitch a ride home as he had lost his car keys while scrounging. He would spend hours in his shed repairing retrieved items. His specialty seemed to be fan heaters and fluorescent lights.

Terry was farewelled at a large funeral in Ulverstone on Friday 25 March.

Vale Terry ex  
"VK7TasmanianTigers."  
Winston VK7EM





# Philips PRM80 six metre conversion

Matt Bilston VK3VS/VK3SMB

The Philips/Simoco PRM80 radio has proven itself to be a great performer on the 2 metre and 70 cm amateur bands, particularly when dealing with pager interference, and there are quite a few being used as 'high power' UHF CBs. They have up to 160 channels, are software programmable, and have too many options to list. There is also an E Band version of this radio that many have dreamed of using in the six metre amateur band for over a decade; however so far this has not been achieved, so much so that they are being thrown out.....

Until now!

I am not a writer by any means, nor am I an RF engineer, so bear with the article and if you have any suggestions, or recommended changes, please contact the author. In this article I will show not only how to convert the E band PRM80 to six metres using garden variety Jaycar, Dick Smith and Altronics components, but also the processes, formulas and errors made during the R&D process. This modification is more than just plugging a piece of commercial radio equipment into a computer and saying 'I modified a commercial two-way to the amateur bands'. Every part of the board dealing with the six metre frequencies needs to be modified in some way. While you are inside the radio, it is probably not a bad idea to replace all the surface mount electro caps as well. These can be replaced with SMD tantalum or Jaycar has electros in the correct size for a replacement.

## Parts required

- M4 x 0.5 x 12 mm F29 or F16 slugs (DSE R5030)
- 1 mm enamel covered wire (Jaycar WW4022)
- 0.8 mm enamel covered wire (Jaycar WW4020)
- 8 MHz crystal (Jaycar RQ5287)
- SMD caps, package 0805 (or you



The PRM80.

could use ceramic caps), in the following values:

- 12 pF (Altronics R8527)
- 33 pF (Altronics R8524)
- 220 pF
- 180 pF x 2
- 56 pF x 4
- 39 pF
- 47 pF (Altronics R8548)
- 22 pF (Altronics R8536)
- Ceramic caps (or SMD caps if you can find big enough ones to handle the grunt) in the following values:
  - 470 pF
  - 390 pF
  - 270 pF
  - 100 pF x 2
  - 68 pF x 2

## Hardware modifications

The RF board will have to be removed from the chassis to complete the modifications. Photo 1 shows the areas of the board which will need modification. Please note this photo is of the prototype and there are extra cuts in tracks and very messy component placement as the work was done from the top side

of the board while still in the chassis, so as to quickly see the results of the change.

## VCOs

Both VCOs require modifying to allow them to operate at the frequencies needed. Have a close look at both VCOs. There are two vacant solder pads for capacitors on each VCO. One is linked to ground, the other connects to the inductor. On the receive VCO place the 12 pF SMD cap on these pads and the 33 pF cap on the transmit VCO. See Photos 2 and 3.

Photo 1: Prototype six metre board.

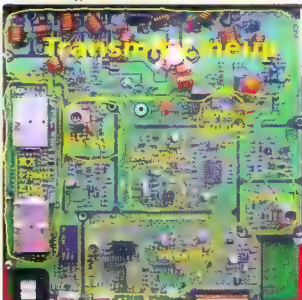




Photo 2: TX VCO

## Receiver front end

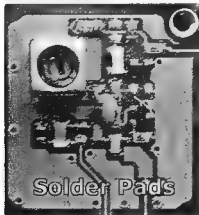
Remove the brass slugs in the four front end inductors. Chop two of the ferrite slugs in half; I used side cutters and it worked, and screw them mid way into the inductors. See Photo 4.

## PA lineup

Wind yourself the following coils:

- A. 1 mm wire, 4.5 turns, inside diameter 3.5 mm and 5.5 mm long, need 2 of these.
- B. 1 mm wire, 6.5 turns, inside diameter 5.5 mm and 7.6 mm long, need 4 of these.
- C. 1 mm wire, 2.5 turns, inside diameter 5.0 mm and 3.3 mm long, need 1 of these.
- D. 1 mm wire, 1.5 turns, inside diameter 5.5 mm and 2.2 mm long, need 1 of these.
- E. 1 mm wire, 3.5 turns, inside diameter 5.5 mm and 4.3 mm long, need 1 of these.
- F. 1 mm wire, 5.5 turns, inside diameter 5.5 mm and 6.5 mm long, need 2 of these.

Photo 3: RX VCO.



- G. 0.8 mm wire, 5.5 turns, inside diameter 6 mm and wound tightly, need 1 of these.
- H. 1 mm wire, 3/4 turns, inside diameter 6 mm, need 1 of these.

Replace the coils as per Photo 5. With the exception of coil G, they should be mounted 2 mm from the circuit board. G will need to be closer so it fits under the lid.

To fit coil H, you need to cut the strip line between the driver and the PA and install it there. About 5 mm closer to the driver from where I have put it is best, however you need to keep in mind mutual coupling between it and coils A and/or C. You can also drill two holes in the board to allow it to be through mounted for strength when operating in mobile conditions. You will need to clear out some earth pad on the other side of the board, though.

Also note with this photo, Photo 5, there is a ceramic cap on the collector of the PA. This is a no-no as there could be extra inductance with the leads. This is a junk box prototype! Photo 6 shows the correct mounting detail for coil H.

There are 17 caps that need changing:

1. 180 pF was 120 pF
2. 270 pF was 180 pF
3. 470 pF was 330 pF
4. 100 pF was 47 pF and 68 pF
5. 390 pF was 270 pF
6. 56 pF was 39 pF
7. 39 pF was 27 pF
8. 68 pF was 47 pF
9. 47 pF was 33 pF
10. 22 pF was 15 pF
11. 220 pF was 180 pF

Replace the caps as per Photo 7.

Using the caps available on the board:

- Move caps 2 and 11 to positions 1.
- Move cap 5 to position 2.
- Move one of cap 6 to position 7.
- Move cap 10 to RX VCO (close enough to 12 pF).

Move cap 9 to TX VCO.

Move one of cap 8 to position 9. From a junky A9 board, you can get two 68 pF large SMD caps from under a loop of wire at the centre rear of the board.

You may find, as I did, that adding the caps from a rubbish A9 board to the caps that need to be changed here will give you the values you need. Ignore the trimmer capacitors in Photo 7, these were installed during the R&D phase....

## Reference crystal

Remove the 10 MHz reference crystal and replace it with the garden variety 8 MHz crystal. Refer Photo 8.

## Programming the six metre frequencies

Here is the part that has had everyone stumped for over a decade.....

If you read all the information on the internet regarding programming frequencies outside the band limits in the PRM80, you can see that the lowest frequency that can be programmed is 58 MHz, using hex editing. How do we get around this? We program the radio in 6.25 kHz steps and now that we have changed the reference crystal by 4/5 the steps have also changed by 4/5, so 6.25 kHz steps become 5 kHz steps. The starting frequency of 58 MHz is 9280 6.25 kHz steps from 0 MHz. So by having 5 kHz steps and programming it as 6.25 kHz steps, we have a starting frequency of 46.4 MHz, and are able to program in 5 kHz steps from here.

As a side issue, if we change the reference crystal to 5 MHz, we change the 6.25 kHz steps to 3.125 kHz steps and the lowest frequency we could get to is 29 MHz..... Hmmm! Using the same theory, we could program a radio as a T band (400 – 440 MHz), use an A9 (VHF high band) board and give the Americans a 200 MHz PRM80.....

Programming the frequencies is not as straight forward as you would like. The transmit frequencies are easy to

Photo 4: RX front end.



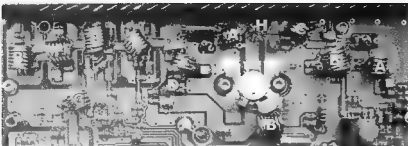


Photo 5: The coils

calculate as they are the desired frequency multiplied by 1.25, that is, 52 MHz multiplied by 1.25 = 65 MHz. Or by doing it correctly, we divide 52 MHz by 5 kHz and then multiply the answer by 6.25 kHz. The programming software will not allow frequencies to be entered below 68 MHz so they have to be hex edited in or by using the band shift procedure in Jason's document (1). This involves changing the hardware code from E band to TU band in the Phillips programming software and entering TU frequencies. When the hardware code is changed back to E band, the frequencies will change to out of band E band frequencies. On my website (2) there is a downloadable PDF file with the conversions from 6 metres to E band to TU band and Hex Codes as well.

Programming the receive frequencies is harder to calculate again, as we have to take into account the IF (21.4 MHz). What we do here is take the desired frequency (that is, 52 MHz), add the IF to it then divide it by 5 kHz. Then multiply that by 6.25 kHz and take the IF from it. If you have calculated it correctly your frequency will end up between 70.35 MHz and 72.85

Photo 6: The correct mounting detail for coil H.



MHz for frequencies between 52 and 54 MHz. These frequencies can be directly programmed into the PRM80 software.

I will be writing a little program written in VB to allow us to enter six metre frequencies and it will spit out a converted frequency and a hex code to go with it. Again see my website (2).

### Programming hints and ideas

Given the nature of the six metre band, programming one of the buttons at the front to give you access to the mute without turning the radio off and on would be a good idea. Another button with the RSSI programmed in will help with alignment of the receiver. RSSI is received signal strength indicator in Phillips talk. Save your file before converting the radio between E band and TU band as you don't want to lose the last 100 channels you just typed.

### Alignment

Parts of this procedure have been extracted from the Phillips PRM8010 service manual (3). As a minimum you will need the following test equipment:

- A variable signal generator. You could get away with using the local oscillator on a scanner with

a 21.4 MHz IF and program it to 74.4 MHz and some attenuator pads.

- A dummy load.
- A frequency counter.

A service monitor would be even better.

1. Program a frequency of 53 MHz into the radio.
2. Turn the power adjustment to half way.
3. Set the radio to receive and using the VCO test point set the voltage to 7.5 volts using the slug in the Rx VCO inductor. The reason we want the voltage lower than the nominal 15 V is the varicaps on the front end use the VCO voltage to tune; if we set the voltage too high they may not tune at six metres. Check the lowest frequency of operation (52 MHz) is above 5.5 V.
4. Set the TX VCO to a similar voltage. See Photo 8 for the VCO TP.
5. Using a signal generator, adjust the slugs in the front end for maximum signal, starting at the antenna socket and working your way towards the front.
6. Repeat point 5 twice more.

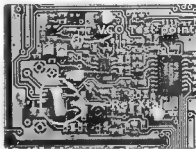
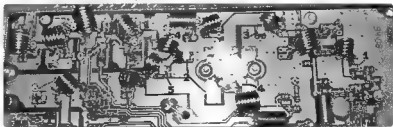


Photo 8: The VCO TP.

Photo 7: The coils, when replaced.



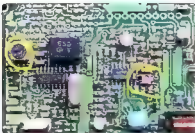


Photo 9: The audio output slug

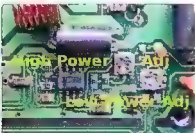
7. Adjust slug for maximum audio output (Photo 9).
8. Disable signal generator, set squelch level to two from the front panel, adjust the trimpot circled in Photo 9 to allow squelch to mute.
9. Select transmit and adjust the power out to 25 W maximum. Refer Photo 10. Check the current is less than 5.5 A. You will need to readjust with the lid on.
10. While transmitting, adjust the slug near the reference crystal to a frequency of 53 MHz. Refer Photo 8.
11. Adjust the deviation on the control board to 5 kHz. Refer Photo 11. If you cannot get enough deviation you will need to change the 68 k resistor near the modulation balance trimpot to 22 k. Refer Photo 12.

For our English friends, the above procedure will work when based on 51 MHz instead of 53 MHz.

You should now have a very sensitive, powerful and stable six metre PRM80 for minimal cost and a winter's afternoon!

Please note these were measured 25 kHz up from the frequency as microprocessor noise was evident.

Photo 10: The adjustment of power, to a maximum of 25 watts.



## Specifications I ended up with

Frequency	Rx sens (12db SINAD)	TX power	TX current
48 MHz	1.173 $\mu$ V	Nil VCO lock	Nil VCO lock
49 MHz	0.268 $\mu$ V	19.6 W	4.28 A
50 MHz	0.252 $\mu$ V	21.7 W	4.58 A
51 MHz	0.241 $\mu$ V	23.5 W	5.87 A
52 MHz	0.241 $\mu$ V	24.7 W	5.11 A
53 MHz	0.239 $\mu$ V	25.3 W	5.22 A
54 MHz	0.241 $\mu$ V	25.1 W	5.23 A
55 MHz	0.271 $\mu$ V	24.5 W	5.08 A
56 MHz	0.436 $\mu$ V	Nil VCO lock	Nil VCO lock
57 MHz	0.456 $\mu$ V	Nil VCO lock	Nil VCO lock
58 MHz	0.472 $\mu$ V	Nil VCO lock	Nil VCO lock
59 MHz	0.492 $\mu$ V	Nil VCO lock	Nil VCO lock
60 MHz	0.518 $\mu$ V	Nil VCO lock	Nil VCO lock

Four of these radios have been built, one by Phil, the others by myself, we both did it with parts from the junk box, with the exception of the crystal. I had nearly every value but 8MHz! Each of the modified radios ended up with similar specifications. These measurements were taken with a Marconi 2955 service monitor.

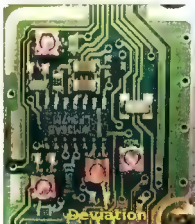
## Errors and headaches during the R&D phase

Many hours of playing has gone into this, particularly trying to work out how to break the magical 58 MHz barrier.

- I went to decompile the firmware in the PMR8030; after seeing the output, I forgot that idea straight away.
- I thought about putting a frequency tripler between the PLL and the prescaler and programming the radio to 156 MHz odd. This was shot down in flames with the availability of something small enough to fit in the radio shield and stability was also going to be an issue.
- I found some 40/41 prescalers. This worked OK at 52 MHz, but due to rounding errors in my mathematics, I was out 80 kHz at 54 MHz. And the steps were quite an odd value. But with Phil clearing the forest so I could see the trees, I found a simple crystal change would have saved me a heap of work.

- After spending around six hours rebuilding the RX front end, changing caps, and so on, I found I didn't need to do all that, all I had to do was change the slugs from brass to ferrite.
- During TX playing, I have managed to damage two PAs as the driver has a staggering amount of gain at 50 MHz.
- After a lot of hair pulling, found out the stripline between the driver and PA is too short, causing it runaway when the case was reassembled due to a mismatch and extra capacitance of the shield.

Photo 11: Adjustment of deviation on the control board



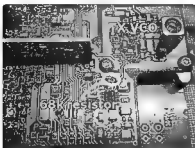


Photo 12 The 68 k resistor

## Problems

If anyone can think of answers to these I would love to know them.

- The repeater defeat button will not work as the IF offset is different due to the 'hacked' programming. If the VCO did lock it would be transmitting above 60 MHz for frequencies programmed in for 53 MHz.
- Microprocessor noise is evident at quite a few places on the band.

## Thanks to

Jason VK7ZJA for his excellent and thorough documentation on the PRM80, and for exhausting every other avenue before I got to them.

Phil VK3ELV for his ideas and the redevelopment of the PA.

Garry VK3XYX for his donation of 'rubbish' E band RF boards.

And my better half for letting me play in the shack a little longer than usual.

Have fun.

## References

1. Jasons PRM80 documentation <http://www.26.brinkster.com/mitaux80/>
2. My PRM80 information <http://www.vk3smb.com/projects/simoco.shtml>
3. Phillips service manual extracts, downloaded from yahoo groups.

## Disclaimer

While all information in this document has been tested by

myself, I offer no liability for any damage caused by using the information within. This document is Copyright and remains the property of Matt Bilston VK3VS. I give my permission for this document to be published in *Amateur Radio*, and similar publications in NZ, UK and USA so long as the original content is not modified in any way other than formatting for the magazine. Remember to identify the case in some way that it has been converted to six metres should the radio end up in commercial hands again.

## Footnote

The author is preparing a follow up article which will address the problems created by changing the reference crystal. The author also notes that he has found that E band FM900s have the correct slugs required.



# Silent Key Jamie ("Joey") Dabner VK7KEG

We regret to let the amateur community know of the passing of Jamie Dabner VK7KEG on Friday 29 April 2011 after a battle with cancer.

Joey came into the hobby as a keen CBER and passed on his enthusiasm to his son Sam who later became VK7FBMX when the Foundation licence became available. Joey was an early adopter of technology and hosted an IRLP node for a long while at his QTH.

When Joey was going for the amateur licence, Chris VK7FCDW can remember for months seeing

little cards (dozens of them) on his desk all relating to the amateur exams, questions and answers. He got there in the end with his full call.

Joey worked for a long time as the gardener at St Johns Park and everyone thought he and the tractor were attached; where ever the tractor was Jamie was, they reckon it was welded to him...HIHI.

He had a love of camping and fishing.

Joey started at the Royal Hobart Hospital at a very young age and later was sent to Peacock Convalescent Hospital to look after

the ground, he used to get into trouble from the matron for eating the apricots off the tree in the grounds by the matron and then got the job of head groundsman at St Johns Park, and when they outsourced the maintenance he elected to go to Medical records at the RHH and really took to it like fish to water before he became ill.

Joey is survived by daughter Mollie and son Sam.

Vale Joey VK7KEG.

Justin VK7TW and Chris VK7FCDW



# VK7news

Justin Giles-Clark VK7TW

Email: vk7tw@wia.org.au

Regional Web Site: <http://reast.asn.au/>

## ILLW

Jim VK3PC reminded the author that VK7 is well represented in the 2011 International Lighthouse and Lightship Weekend. The list at the time of writing was VK7DB at Sandy Cape, VK7EM at Mersey Bluff, VK7HKN at Eddystone Point, VK7NET at Table Cape, VK7KT at Bluff Hill, VK7VTX at Low Head, VK7ZM at Rocky Cape, VK7ZE at Cape Wickham who will join VK3VTH/7 at the Currie Light, both on King Island. It all happens on the weekend of 20-21 August 2011.

## Northern Tasmania Amateur Radio Club

NTARC's May gathering was a dinner presentation at Tranquillity Gardens in the beautiful Tamar Valley. Presenter was Stuart from the Australian Customs Service and by all accounts it was a great talk about how the service is protecting Australia. Stuart's talk included pictures of the vast array of people, technology and animals used to detect and prevent harmful items and illegal items from entering Australia. Thanks go to Dion VK7DB for the recent TLC to the VK7RAL repeater on Companion Hill.

During the Space Shuttle Endeavour's May trip to the International Space Station, Rick VK7HBR's EchoLink node was heard in Launceston with the mission audio feed going out on 145.425 MHz and thanks to Rick for this historic audio transmission.

## Cradle Coast Amateur Radio Club

Congratulations to Steve Terns who has successfully upgraded from VK7FUBI to VK7NZL. We look forward to hearing the new callsign on the air.



The author (left) interviewing Dave VK4ICE on air in the DATV studio (Photo courtesy of VK7DY).

## North West Tasmanian Amateur TeleVision Group

Interested in training or assessments for an amateur radio licence in the North West region of Tasmania? NWTATVG can provide this as well as facilitators from the Radio and Electronics School. For more information, please contact the Club's Learning Organizer Tony VK7AX.

## Radio and Electronics Association of Southern Tasmania

Congratulations to REAST on successfully obtaining a \$1000 grant to provide scholarships to cover Foundation training, assessment, licence fees and membership of REAST and the WIA. Discussions with a local High School are well underway and training will commence soon.

REAST's May presentation continued our Antarctic theme with a fascinating presentation by Alan VK7KAJ. Alan has wintered in Antarctica over five expeditions as a radio technician at both Mawson and Davis stations. Alan's talk and slides were focussed on the technology

used by each expedition and the maintenance and unique conditions that Antarctica presents to the radio tech. Alan also gave an idea of the living conditions and of some very humorous activities and events. Thanks Alan.

A group of interested families gathered at the clubrooms for an introduction to art and science of Geocaching

one May weekend. After a short introduction and demonstration we trekked off into the bush of the Queen's Domain to find a nearby cache. Warren VK7FEET's geo-kids Joey and Ryna pulled the hidden treasure and signed the logbook. A great afternoon was had by all.

Our DATV nights are very popular with a great crowd each Wednesday night. Some of the topics included: Review of the RSGB produced CD-ROM - 50 Years of Technical Topics from Pat Hawker G3VA, putting a second battery in a vehicle, sync generation using a commercial Tektronix unit, review of the latest Silicon Chip magazine, Arduino Duemilanove microcontroller board and On Screen Display chip enabling a DATV watermark for the studio and our new video mixer with chroma-key capability. We have also had many great video presentations that have been added to the video library. One memorable live interview was with Dave VK4ICE and XYL Cheryl who visited and Dave took the viewers through his antenna experiments.



# The 'DTMF engine'

Dale Hughes VK1DSH

This project started out as a simple 'Dual Tone Multi Frequency' (DTMF) encoder so that I could access the local IRLP node. However it turned into something more complex and interesting; for the want of something better I have called it a 'DTMF engine'. So what can it do?

1. Send DTMF tone sequences, either 'live' from the local keyboard or from previously stored number sequences. The unit can generate the 16 standard DTMF tones and can send sequences of tones much like a standard telephone. The tone output can be connected to the microphone input of a transceiver and tone sequences can be sent to access IRLP nodes or perform other tasks that might require DTMF tones.
2. Receive, decode and display DTMF tones and tone sequences.
3. Send and receive short text and/or remote control messages to addressed units. Messages may be addressed to specific call signs and may be either a text message up to 32 characters long, or the message may be to turn 'on' or 'off' a digital output on the addressed receiver. Eight digital outputs have been provided for remote control purposes. Specific 'user' call signs can be set so that only certain users have access to the remote control functions at any given receiver. The text and remote control messages are compressed and 'packetised' with source and destination addresses and 16 bit Cyclic Redundancy Code (CRC) word added to each message packet. This provides a robust and reliable messaging system similar to that available from mobile telephone handsets. The messages are sent as a sequence of DTMF tone pairs.



Figure 1: The DTMF engine with optional pick-up microphone. Connections to the radio and 12 VDC are on the back of the unit and operator connections (microphone and key) are on the front. The prototype unit was built into a small home-made enclosure that could sit adjacent to the transceiver.

4. Generate and send Morse code characters, either from a local 'paddle' type key or from previously stored message strings. In this mode a number of output options exist: the CW signal can be sent as an actual tone which can be connected to the radio microphone input, or the CW output can be sent as logic levels which can be connected to the 'key' input of most transceivers. Operator name, call sign, location and CQ messages can be stored and recalled at any time. The frequency of the generated tone and keying rate are user adjustable via menu options.
- For all of the options above, the unit can provide appropriate 'Press-To-Talk' (PTT) control as well as the tone signalling output which can be

connected to your transceiver. The 16 button key pad can generate all of the alphabetic characters, numbers and a limited set of punctuation and other symbols in much the same way as that provided by the key pad on a mobile telephone. In use, all of the system options are accessed through a simple menu system and the user is prompted along the way.

The following text provides background information on DTMF signalling as well as a description of the messaging and remote control format used in the DTMF engine. A detailed description of the circuit design is also given.

## DTMF background information

DTMF signalling has been used in conventional line and radio telephone systems for many years. The system allows one of sixteen numbers to be





sent by transmitting a combination of two tones from a specified set of tones. This is best described by viewing the tone pairs as a matrix on table below:

	1209 Hz	1336 Hz	1477 Hz	1633 Hz
697 Hz	1	2	3	A
770 Hz	4	5	6	B
852 Hz	7	8	9	C
941 Hz	*	0	#	D

Table 1: DTMF tone matrix

It can be seen that any one of 16 characters can be made up by any two of eight possible tones. When a character is sent, two tones are simultaneously transmitted, for example, the '8' character is sent using the frequencies 1336 and 852 Hz. Note that there are four characters (A,B,C and D) that are not usually available from a standard telephone keypad but these are available from the DTMF engine.

As these tones are used in virtually every telephone system throughout the world, there are low cost chips readily available which can generate and receive/decode the DTMF signals. The stability of the generated frequency is ensured by the use of quartz crystal oscillators. There are a number of different chip-sets available from the major suppliers and I choose the Holtek HD9170 and HT9200 pair which are available from Futurlec (1). Functionally similar chips are available from other manufacturers, some of which are pin compatible with the Holtek devices. Both parallel and serial interface styles are available depending on the users need. Datasheets and application notes for the DTMF chips can be obtained from the Holtek website (2).

## Circuit description

The heart of the system is an Atmel ATmega8535 microcontroller (U9). This chip controls the DTMF chips, the display, keyboard and various inputs and outputs. The chip contains 512 bytes of static RAM which is used to store messages and volatile configuration details. It also contains 256 bytes of EEPROM which are used to hold non-volatile configuration information such as user call signs, signalling rates and so on. The user interface consists of a two line by sixteen characters Liquid Crystal Display and a sixteen button keypad. The microcontroller runs at 4 MHz and can be programmed in-situ through its ISP port.

The LCD uses the 4-bit interface mode as this saves a number of Input/Output (I/O) lines from U9. The 16 button keypad is scanned and de-bounced by software.

The two DTMF chips are clocked by a 3.5795 MHz crystal with the DTMF receiver (U7) providing the clock signal to the DTMF transmitter (U6). DTMF tones that are received from the input are decoded by U7 and passed to the microcontroller via a 4-bit buss. When a valid tone is received, U7 signals the microcontroller by asserting pin 15 which generates an interrupt causing U9 to read the received DTMF 4-bit code. The audio input to U7 is passed through voltage follower (U2a) which is one half of a dual operational amplifier. As the amplifier is running

on a single voltage supply, the bias point of the amplifier is set by the voltage divider on its input and the AC coupled output isolates the output offset voltage from the input of the DTMF receiver. The input stage is not strictly necessary but it provides a useful amount of isolation and protects the DTMF receiver from adverse situations.

The DTMF transmitter (U6) is controlled through a serial interface to the microcontroller. A clock and data line send a 5-bit code from U9 to U6; the code selects one of the sixteen possible DTMF tone pairs, or one of eight possible single tones, or can switch off the output tone altogether. When the unit is configured to operate as a CW keyer, U6 is setup to only transmit a single tone and the operator can select which tone frequency is used via a menu option.

So that the duration of the output tone (either a DTMF pair or a single frequency for CW) can be accurately controlled, a 74HC4066 analog switch (U4) is used to gate the tone through to the output amplifier (U2b). Control of U4 is by means of a digital output line from U9 and the control line also passes to a transistor (Q2) which can be connected to the 'key' input of a CW transmitter if required. Two analog gates are also switched and can be used if required. Note that this output is separate to the 'press-to-talk' (PTT) output which is asserted whenever the unit enters 'transmit' mode (either for sending DTMF tones or for sending CW messages).

An 8-bit latch (U8) is provided for remote control functions and the user can turn each output on or off remotely by sending the appropriate codes to an addressed unit. The output latch shares the I/O lines of U9 with the LCD. Separate latch-enable and LCD enable lines ensure correct operation of the different hardware. The TTL level output of the latch can be connected to relays or indicators using suitable interface transistors.

If required, a simple 'paddle' type key can be used to send Morse code; dot, dash and PTT inputs are pulled up through 1k resistors. An RS232 interface (U5 and associated components) are shown on the schematic diagram and the interface was included for possible future development, but the current software version does not support their use.

For most applications the audio input will be from a high level source, for example, a loud speaker or headphone output from a receiver, but for applications where it might be necessary to use a microphone to pick up the DTMF tones a simple audio amplifier is provided on a separate PCB. The amplifier uses a low cost op-amp and provides a gain of 100. I found that a small electret microphone was very suitable and could pick up DTMF tones from some distance away.

## Software

As is the trend in our increasingly digital world, most of the sophistication is in the software and that is hard to describe in the same way that a circuits operation may be described. The software which controls the unit is written in assembler code using the Atmel Studio4 software, the source code is available to anyone who would like to use it.

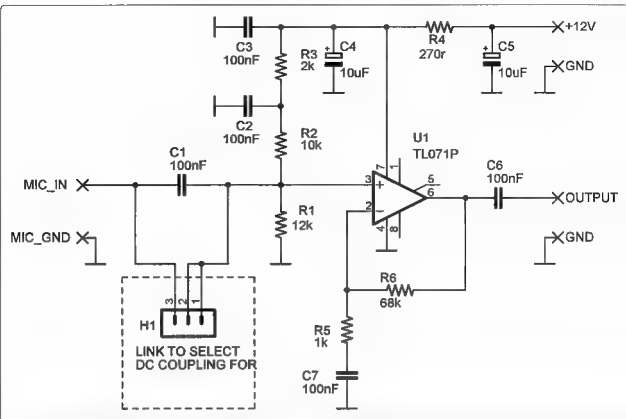


Figure 3: Schematic diagram of the optional audio pre-amplifier. If an electret microphone is used it will be necessary to link pins 2 and 3 on header H1 so that a DC bias can be applied to the microphone element. No link is required if a dynamic microphone is used.

The main functional area that is worth discussing is the messaging and remote control functions as these are the most complicated part of the software. Short text messages up to 32 characters can be sent from one unit to another. The message structure is as follows and each 'packet' contains the following:

Destination call sign:	8 bytes	(who receives the message)
Originating call sign:	8 bytes	(who sent the message)
Command field:	1 byte	(message type)
Message field:	32 bytes maximum	(text or command)
CRC word:	2 bytes	(error checking)

Each byte is transmitted as two sequential DTMF tones: one tone for the most significant four bits and another tone for the least significant four bits. However to increase the transmission speed, the message (except for the 16-bit CRC word) is compressed. This is done by squashing each eight-bit character into six bits before transmitting as follows:

Original four ASCII characters:	0123 (for example)
Hexadecimal equivalent:	30 31 32 33
Subtract 20 (hex):	10 11 12 13
Squash into 3 bytes:	41 14 93

This works because the character set has been restricted to the ASCII characters that can be represented in six bits, but this turns out to be no restriction as it covers all the 26 character alphabet (upper case only), numbers and common punctuation symbols. This range of ASCII characters spans the hexadecimal values 20 to 5f which needs seven bits for transmission, but by subtracting hexadecimal 20, the range is changed to 00 to 3f which only requires six bits. Hexadecimal 20 is added by the receiver when the message is expanded for display. The end result of all of this is that any given message can be made 25% smaller which reduces transmission time. Transmission time for a typical message is several seconds depending on the tone duration set by the user and this can be adjusted to suit propagation conditions or other factors. As opposed to other forms of serial transmission there is no requirement for the receiver and transmitter to be set for the same timing as the DTMF tone generator and receiver are completely independent.

The CRC check is a means of ensuring that the message is received without error. Using this technique each message is considered as one long 'number' and is divided by another number (usually called the CRC or generator polynomial). The division process is done by bit shift and exclusive OR operations; the result of this

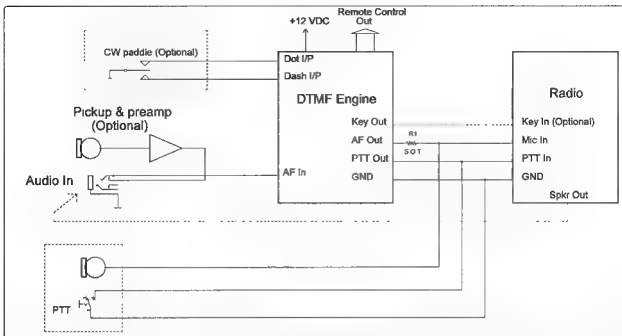


Figure 4: Interconnections between the DTMF engine and external devices. The arrangement allows flexible connection options to most transceivers. Optional connections are shown by dashed lines. The value of R1 will need to be experimentally determined so that the tone input to radio microphone input has the correct level.

calculation is a two byte 'remainder' which is called the Cyclic Redundancy Code. Before transmission the CRC is appended to the message. When the message is received the receiver calculates the CRC and compares the locally calculated version with that which was received and if they are equal the message is assumed to contain no errors. If the received and calculated CRCs are not equal the message is assumed to be corrupt; depending upon the system the receiver may ask the sender to send the message again; or as in this case, the receiver ignores the message.

So how does the user know if the message has been correctly received? The receiver checks the message and if no errors are detected the receiver transmits an acknowledgement signal – the Morse code 'R' character. In this case – and the originating operator will hear the acknowledgment code and know that the message was received correctly.

If the polynomial is correctly chosen, there is a greater than 99.99% chance of detecting all possible errors: good enough for our requirements. The mathematics which underlies the CRC process is quite complex and interested readers will find a considerable amount of information is available on the internet (3). Atmel provide an application note which explains the process and provides some software examples (4).

Note that this whole process is transparent to the user and based upon well established 'packet' radio techniques except that no automatic re-transmission takes place if an error is detected. The system is not designed to compete with existing packet radio or other data

transmission systems, but to simply try something new and to encourage experimentation – something fun and functional!

### Construction notes

The circuit is quite straightforward and all of the components are mounted on a double-sided printed circuit board. No surface mount components have been used in this design as all of the parts were available in leaded versions. Artwork for the printed circuit board and assembler source code are available to anyone who would like to make a unit.

### Suppliers

The DTMF generator and receiver chips and the Atmel microcontroller are available through Futurlec, as are many of the other more common components. All the other components are available through the usual suppliers.

### References

1. Parts suppliers and data sheets.  
<http://www.futurlec.com.au/>
2. DTMF chip data sheet and application notes.  
<http://www.holtek.com>
3. CRC theory and information.  
[http://en.wikipedia.org/wiki/Cyclic\\_redundancy\\_check](http://en.wikipedia.org/wiki/Cyclic_redundancy_check)
4. Atmel CRC software example  
[http://www.atmel.com/dyn/resources/prod\\_documents/doc1143.pdf](http://www.atmel.com/dyn/resources/prod_documents/doc1143.pdf)



# Hamads

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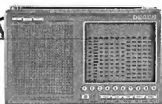
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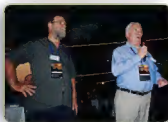
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Spud VK8ZWM and Michael VK3KI.



At the Darwin Trailer Boat Club on Friday night.



Another group enjoying the Friday night function.



Spud VK8ZWM with the Registration team.



Members gathering for the AGM.



Sunset view from Mindil Beach.



AGM/Open Forum participants during a break in proceedings.



Michael VK3KI presents Spud VK8ZWM with an engraved tray.



Trent VK4TI chatting with Director Peter VK3MV.



Local legend Frank VK8FT.

A group at Litchfield National Park.



Some views of people and places from the recent WIA Annual Conference, held in Darwin over the weekend May 27-29. A highlight of the weekend was a visit to Litchfield National Park on Sunday. Main photo is from the Darwin Trailer Boat Club (photo by John VK3PZ). Other photos by Doug McArthur VK3UM, Dianne Ashton VK3FDLZ, Clive Sait VK4ACC and John Longayroux VK3PZ.



Wangi Falls in the Litchfield National Park.



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